American Forestry

VOL. XIX JUNE, 1913 No. 5

THE NATIONAL FORESTS AS A PEOPLE'S PLAYGROUND

By Agnes C. Laut

THE conservation of National Forests has become so involved in political acrimony of late years that the public have completely lost sight of one of the most important functions of this great cloudland domain. National Forests mean more than the preservation of timber-bearing lands and grazing rights. They stand for the preservation of a People's Playground and Health Resort without a peer in the whole wide world.

Tell the average Easterner, or Middle-Westerner, that the area of the National Forests is greater than any two or three European kingdoms; that a Forest Ranger of the United States patrols more timber land than thirty German rangers; that a United States Fire Warden is not only a fire fighter and a "trust buster" and a game protector but the man-on-the-spot for whatever he must—and it all doesn't mean very much to the man who has not seen things with his own eyes. The average man knows that the National Forests include pretty much all the timber land not already grabbed up by the big companies. He knows, too, that they include pretty nearly all the political squabbles of the last four years from water power and irrigation rights to mineral claims and the control of flood waters generated at the head of the big streams; but does he realize that the National Forests preserve for him—no matter who he is, nor where he is—the best and cheapest Playground and Health Resort on the face of the globe?

Draw a half circle down the face of the Eastern Rocky Mountain States from Montana to Texas! Complete the circle, round out, to the Pacific. Within that circle are the Western National Forests. Draw a similar circle from the White Mountains down to the Cumberlands in the Eastern States. Within that circle is the Eastern group of National Forests. Well—what's that to you? Wait a minute till you examine what's inside those circles besides timber and saw-mills and saw-offs and political fights! Within those two circles are more mountains than in Switzerland; more Alpine lakes than in the Trossachs of Scotland or the lake country of Italy; better fishing than in Labrador or Newfoundland—the lands of the silver harvests of the seas; a bigger and more picturesque desert than the Sahara; in two sections, at least, as much primitive game as when Boone and Crockett and Kit Carson hunted and slept under the roofless sky; an antiquity of a dead civilization, cave cities, roofless houses of 700 rooms, relics of prehistoric stone-age man and beast antedating the Pyramids by thousands of years; mines whence the crowns of Spain have drawn their rarest jewels; extinct volcanoes where you can either look down into the workshop of creation, or heave up a private exhibition of the gods of earth and fire at work by dropping down a sod or lump of earth; trenched cañons hundreds of miles long, at the edge of which you can look down at the towering mountain peaks barely reaching up to your feet; waterfalls that call with the voice of a Niagara but fall such dizzy heights they blow in and out with the wind tenuous as thistledown; huge

RUINS OF FRIJOLES CANYON. RITO DE LAS FRIJOLES, NEW MEXICO. LOOKING DOWN ON A PREHISTORIC DWELLING FROM ONE OF THE UPPER CAVES.

CLIFF DWELLING RUINS, NOW A NATIONAL MONUMENT: KNOWN AS MONTEZUMA CASTLE. ON BEAVER CREEK BETWEEN THE COCONINO AND THE PRESCOTT NATIONAL FORESTS, ARIZONA.

A FOREST RANGER STATION ON THE LOLO NATIONAL FOREST.

trees that antedate the Flood and hold transfixed in their onyx and agate bars the rainbow lights of a million years; ozone and sunbeams and pine resin and balm that cannot be bottled and will do for diseased lungs and fagged brains and town-stifled souls what all the serums and anti-toxins of the schools cannot cure.

All this is so beautifully big and broad and up in air, let us get down to facts and how and where—especially *how much* in terms of the dollar bill!

I shall speak particularly of the Western Belt of Forests, because the Eastern Belt has only recently been brought under the jurisdiction of the Federal Forest Service; because also—if ever the question is brought up whether the Forests should be put back under State control, it is worth while for the Easterner and Southerner and Middle-Westerner to know just what their individual interests are in these National Forests of the Rocky Mountains. Apart from lumber and "trust-busting," has the Easterner any personal interest in keeping the Forests of the West—national? Does he own anything in them? Can they do anything for him? Will they add one jot to the well being of the East? Will they help to keep at home in America the two or three hundred million dollars a year that American tourists spend in Europe? Two or three hundred millions a year is a nifty, tidy sum. It is five times the annual appropriation for rivers and harbors. At ten millions apiece, it would build annually thirty war vessels of first rank; or at one million apiece subsidy, it would build 300 vessels a year for a merchant marine the size of the biggest Cunarder or the biggest Hamburg-American. At no time have either of these two liners received a subsidy exceeding a million a year. Yet between two and three hundred million a year is the total—according to the bankers of London and Paris—of what American tourists spend seeing the wonders of foreign lands. What if they spent half that seeing the wonders of their own lands? Would it help matters along a bit as to keeping gold on this side—

RUINS OF OLD SPANISH-INDIAN CHURCH KNOWN AS ABO RUINS. THESE BELONG TO THE 16TH OR 17TH CENTURY. ABO, TORRANCE CO., MANZO NATIONAL FOREST, NEW MEXICO.

easier money, more prosperous merchants and railroads and hotels? Asked why the foreign lines were building bigger and bigger, more and more expensive and luxurious ships, the president of a foreign company that pays dividends of from 10 to 14 per cent a year answered perfectly frankly "American tourist traffic is the great prize for which we struggle." What if we kept half that prize on this side and shipped half those tourists out to see the wonders of their own land? Does that interest the Eastern banker as to keeping the Mountain Forests a People's Playground and Health Resort?

Then, there is the great army of men and women workers, good stay-at-home Americans, who must have an outdoor holiday once a year, cheap or dear. That is, they must have it, or go warped and bankrupt as to nerves and temper and wholesome health. The man or woman who doesn't wrap up in a blanket under the stars at least once a year doesn't know what being alive means, and should be classified as the most hopeless kind of withered cave-dweller. A few years ago only a few thousand people a year went into the Pike's Peak region of Colorado. Today, 100,000 a year go in to play in that wonderland. Three years ago, when I asked the Forest Service to give me the exact total of tourists who had gone into Grand Canyon, they placed the total around 10,000. Last year, more than 30,000 went in. Not long since, only five or six thousand people a year went in to camp in what are known as the Angeles and Cleveland Forests in from the Pacific. Today, 100,000 people go in every summer; and the fun costs them all the way from fifty cents to $10 a day, according to their taste for spending; but the man who spends $10 a day can't buy one jot more of the stars or the sky, the ozone or the sunbeams, the trout or the honey dew of early morning hours, than the little factory workers or messenger boys, who spend only fifty cents a day. It is something to thank the Great-God-of-the-Out-Doors for that though you may quarrel over the National Forests, you can't bottle them. In a word, in 1910, it was carefully figured out that 405,775 people holidayed and played and rested and slept under the stars in the National Forests. Today, it would be a safe wager that at least a million Easterners and Middle-Westerners, Texans and New Yorkers and Nebraskans are

RECONNAISSANCE PARTY CAMP OUTFIT, KAIBAB NATIONAL FOREST, ARIZONA.

THE OLD AND NEW CABIN. BEAR CANYON RANGER STATION, GILA NATIONAL FOREST, NEW MEXICO.

REFORESTATION ON THE PIKE NATIONAL FOREST.

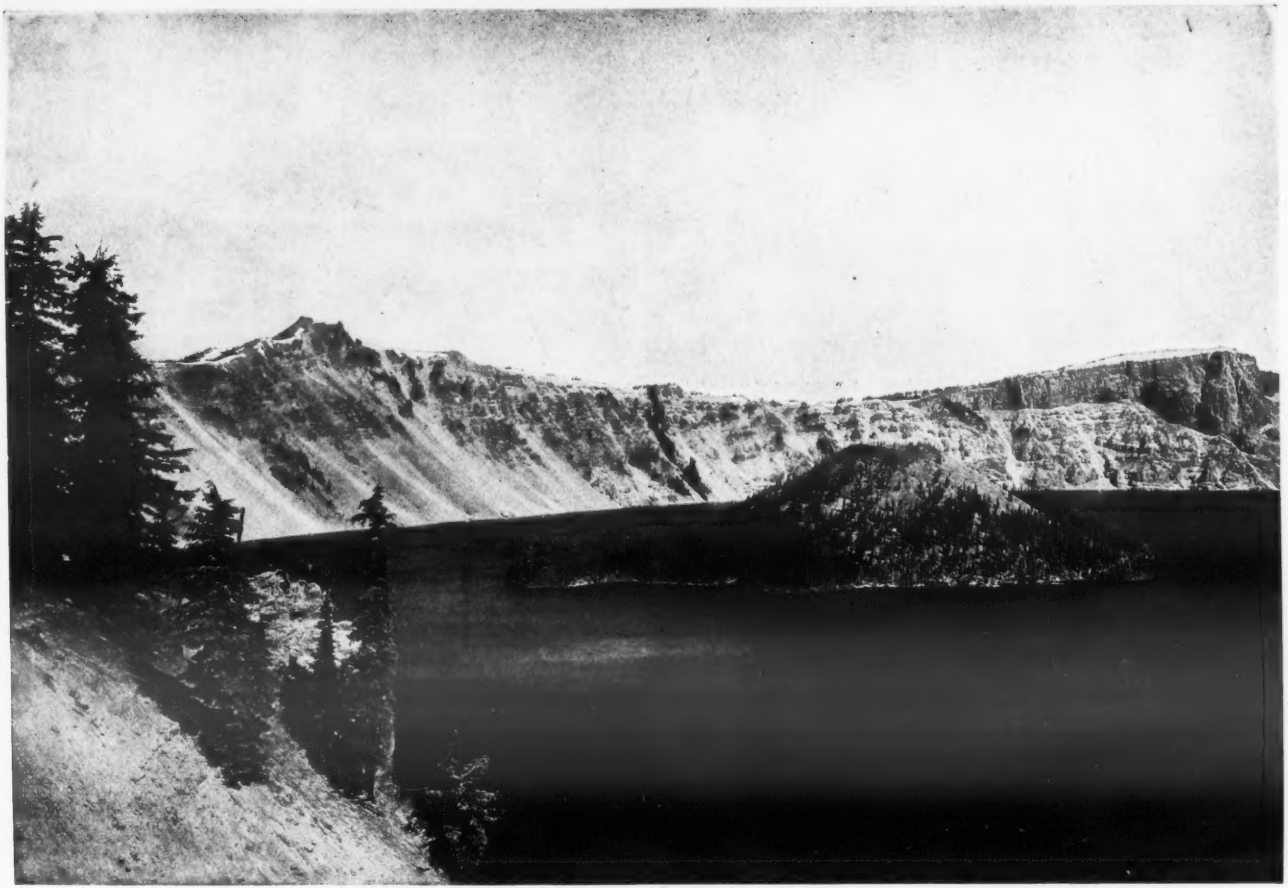
using the National Forests as a People's Playground and Health Resort.

Now, to get down to the brass tacks of the practical man, who usually execrates poetry with his mouth and lives it with all his might—*where is what, and how?*

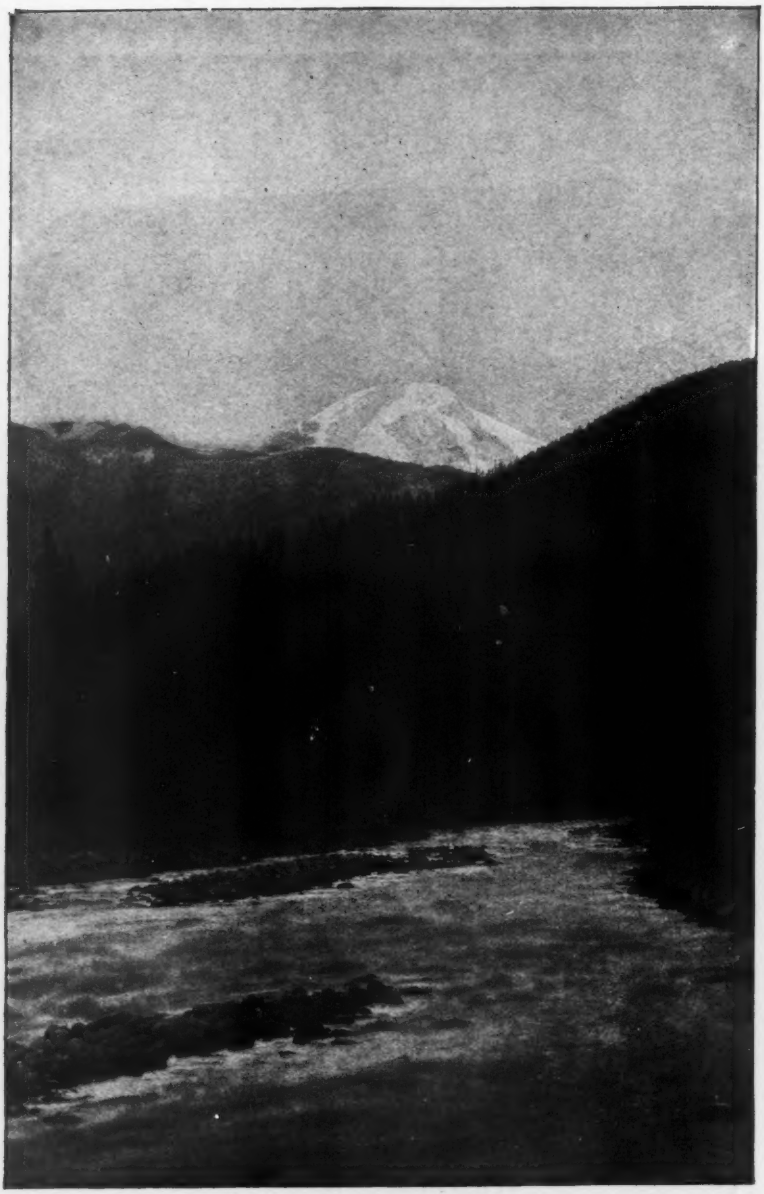
First—how?

You can buy a round-trip ticket in the Eastern Atlantic States that will make a complete circuit of all the National Forests for $105. From Chicago you can buy a ticket to the Rocky Mountain States from $25 to $37. A similar sum will take you into the particular Forest which you choose for your holiday; and a similar sum bring you home. The round-trip summer ticket is the cheapest, whichever Forest you visit. Next point—you have decided which Forest to play in. Don't waste one day in the city where you land! It will only be a Western replica of an Eastern city. Go straight to the Forest Supervisor's office in that city—there are Forestry Officers in all the main Rocky Mountain cities. He will tell you where to go for what you want, where to live and how to live. For $10 up or down a week—generally down—you can usually board at a little hotel right in the heart of the Forests. Or you can rent a shack and do your own housekeeping. Or you can buy a tent and go out and camp and cater for yourself. Or you can rent a tent.

Is it safe for a woman, or for a man? I answer as a woman; and I think I have been in all the Mountain Forests but two or three. It is as safe for a woman as a man—safer than in an Eastern city—utterly safe if you go in under Forest Service guidance, safe always except in two sections; and those sections are as unsafe for a man as a woman. Those two sections are—in the heavily timbered region of the North-West Pacific States and in the Desert region of the arid South-West. Where trees form a thicket overhead, and hanging moss shuts out sunlight and all signs of direction, and ferns are high as your head, you must either camp along and keep to the Forest trails, or take a local guide. In the arid South-West, say the Desert where the vast sheep herds graze—you must either know where the water pools are, or keep to the beaten trail; and remember that the beaten trail may be wiped out in a night by a sandstorm, as the trail over Northern snows is wiped out by a



WESTERN BORDER OF CRATER LAKE, OREGON, SHOWING WIZARD ISLAND, THE VOLCANIC CONE RISING OUT OF THE WATER.



VIEW OF MOUNT BAKER, WASHINGTON FOREST RESERVE.

KOLANA ROCK IN HETCH-HETCHY VALLEY.

blizzard. In fact, if I had to choose between two dangers—a blizzard on a Northern trail or lack of water on a Southern trail, I'd take the odds of the blizzard as the lesser danger. Curl yourself up in furs beside a log fire; and, with provisions, you can wait for a Northern blizzard to pass; but curl yourself up in a tent in the Desert in a sandstorm, and lack of water may have you delirious in twenty-four or forty-eight hours. Both these dangers —getting lost in the heavy timbers and failing to find the watering pools—are avoided by going in under Forest Service guidance—which costs you nothing.

If you are a motor enthusiast, motor roads now connect the most of the Western Forests in a 10,000-mile belt that is broken in only three or four places. By writing the Forest Service, you can get a map of these motor roads. There is a still cheaper way to have your holiday in the Forests. You can rent or buy outright a democrat wagon with tent and team, and drive from point to point as the mood takes you—fishing today, hunting tomorrow, mountain climbing, botanizing, or simply resting. While a license is required to hunt deer and what is known as game, predatory animals are open prey to any shot. The Forest Supervisor will give you details of this, as well as the season for game in each State.

As to cost—it will be exactly as much or as little as you make it. You can stay at a palatial hotel with a room and bath for $5 to $7 a day; or you can have your own tent with room and bath for 50 cents a day. A guide in the North will cost you $3 to $5 a day—the first figure if you don't make the mistake of wearing a millionaire air when you really are not a thousandaire. Guides in the South-West you can get for $30 a month, also a cook. If you know how, you can keep your food bill in camp for three and four course meals down to $1.50 a week for each camper.

Now, where will you go? That depends on what you want; but make up your mind to this—you cannot see all the National Forests in one year; no, nor in ten years. They are a playground for all time, for all people, for all needs, for all purses. You wouldn't try in one season to see all Switzerland, and cover the Sahara, and trip up the Nile, and interview the Sphinx, and excavate a few buried cities in Asia Minor, and explore a few Vesuviuses,

FOREST RANGERS SOWING SEED ON THE SNOW ON A NATIONAL FOREST.

LOOKING UP HETCH-HETCHY VALLEY FROM SURPRISE POINT, TUEULALA AND WAPAMA FALLS, WITH EL CAPITAN BETWEEN, KOLANA ROCK ON RIGHT.

THE HOME OF A FOREST RANGER, RIO GRANDE NATIONAL FOREST, COLORADO.

and drink in all the beauty of the Italian Lake Country, and "do" the Riviera, and shoot some deer in Scotland—would you? Well, then, don't be a fool and try the impossible in your native land! If you go once to the National Forests, you will go again and again!

Where will you go? What do you want? I shall try to answer with the simplicity of a school first primer.

If you want to climb mountains, go to Colorado, or Glacier Park, or Mt. Ranier, or the Yosemite! The best glaciers are, of course, farthest North, though I have seen whooping snowstorms on the upper peaks of Colorado in August. The Alpine Lakes—I mean the lakes of the peacock blue and the rainbow trout, you will find in Colorado and California and Idaho and Montana and Washington. Trout fishing that is unsurpassed you will also find in the White Mountains of Arizona. Big game you will find in the same Forests, plus Wyoming. The Sahara and Egypt and Arabia of America with prehistoric ruins to make you regard the Old World as young—you will find in the South-West, New Mexico and Arizona, and those sections of Utah and Colorado which border New Mexico and Arizona. To get the real prehistoric shivers down your spine, go and sleep in the caves of the Frijoles out from Santa Fe, or in the Mesa Verde, Colorado, or in the Gila north of Silver City, or the Montezuma and Casa Grande Ruins of Arizona. You can camp in these caves free. For extinct volcanoes, you need not go as far as Alaska. You can find them either in the Yellowstone, or up at Crater Lake, on the borders of Oregon and California, where a huge volcanic mountain blew up and sank in a bottomless blue Alpine lake. Grand Canyon will give you the senation of walking the mountain peaks beneath the floor of the Desert at your feet; and the Petrified Forests will transport you back to the days before the Flood. As for waterfalls and big trees, try Hetch-Hetchy and the Mariposa Grove of California.

If you look back now at your belt line trip ticket, you will find it will bring you within distance of all these points; but it isn't what you see that will mend your tiredness. It is what you do, and don't do. Whether the tireless sunbeams of the high dry desert or the restful resin of the Forests are what you need, you alone know; but you'll find both in the National Forests of the West at a cost to meet the exigencies of the slimmest or fattest purse.

PLANTED 200,000 SEEDLINGS.

Mr. James W. Sewall, of Old Town, Maine, has a crew of men in Northern New York, planting 200,000 white and Scotch pine on burnt land there.

FOREST ENGINEERS ANNOUNCEMENT

Vitale and Rothery, Forest Engineers, announce the removal of their offices to 527 Fifth Avenue, New York, on May 1, 1913. Telephone 4514 Murray Hill.

HARVARD SCHOOL OF FORESTRY.

The Harvard School of Forestry will hereafter be so organized that the first year (a calendar year beginning July 7) will include only general and fundamental technical courses, and the second year (an academic year beginning September 22) will be devoted to advanced work to be chosen among four special fields.

FOREST FIRE PREVENTION

By Warren H. Miller, M. F., *Editor, Field and Stream*

IN putting down these few notes my intention is to avoid repetition of the extensive literature already published on the subject, familiar as it is to all. Fire protection is still by far our most important problem, and any methods of control that have been tried out in the many forests of the world should not only be recorded in print in the pages of such a journal as American Forestry, but should receive the most careful consideration by our foresters with view to adaption to our own practice if feasible.

While, in general, our methods of fire fighting are the most advanced of any, our methods of *prevention* are rather behind, due principally to lack of funds to carry out the necessary work. The method of attacking ground fires along both flanks and reducing the front to a point is universally used in Europe as well as here, only we have advanced past the flail of green branches and the wet gunny sack to pack sprayers and horse fire extinguishers. The following from Boppe's *Les Forets,* published recently in France, has a familiar ring: "The men arrive furnished with shovels, mattocks and rakes; if the fire proves to be of small extent and little active, it is put out by stamping, by covering it with shovelfuls of earth and by beating it with branches; this last method is not too much to be recommended, for, in scattering the burning material in every direction one might set new fires behind the workers. One attacks the fire preferably on its flanks in the direction of its progress, seeking to narrow, little by little, the width of its front until the closure is complete."

Add to this the pack harness and tump strap fire extinguisher and you have our most advanced American practice.

However, they appear to take much more seriously than we do the effects of ground fires on the young growths. Most of our woodlots show the scarred state of all the young hardwood saplings in an American forest a few years after a ground fire. The trees have recovered, after a fashion, but will grow very slowly and will never make a first-class stand. Realizing that this will be the case and that time will be saved by replanting the section to new trees, the foreign practice is most drastic. Again quoting from Boppe on the effects of ground fires: "In general, the large trees suffer but little; on the other hand the young saplings are almost always mortally injured; it is easy to determine the situation by examination of the cambium tissue laid bare by incisions of the penknife on average trunks, making these cuts on all species. If the cambium appears dark, even slightly, it is necessary to prescribe an immediate cut; otherwise the arrival of new leaves will mask the situation, buds will appear from the sap already in the woody tissues; but the sap cannot descend, or operate through the affected cambial tissue, the roots, insufficiently nourished if not completely killed, will give the following spring new growths feeble and without promise of future betterment. In such a dilemma it is better to resolve upon an immediate sacrifice; for if a great number of affected trees continue to live, for better or for worse, one will see appearing at their feet, over the burned area, deep bark scars which retard their growths and depreciate their market value." All of which the experience in our own forests bears out completely.

In the case of certain conifers, however, the effects of ground fires are not so serious. A rough bark, even while consumed by the flames, will shield the cambium layer until the heat of the fire has died out. According to German authorities a temperature of 140 degrees must be raised and held for some time in the cambium sap in order to warp and

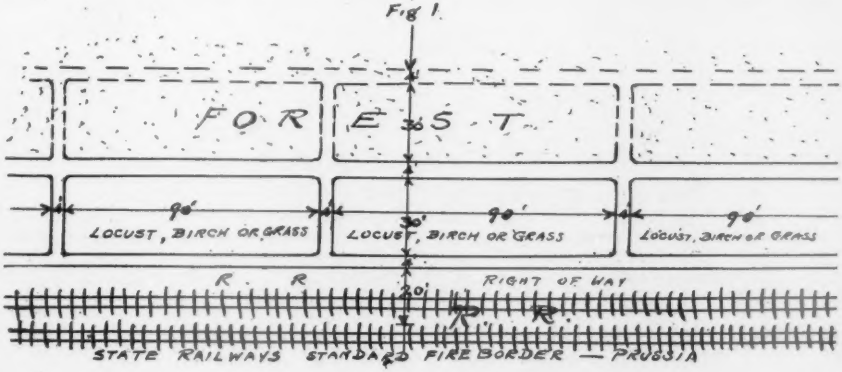
shrink the cellular passages. As the specific heat of sap is not much less than that of water itself, the passing flames of a ground fire in wire grass, though burning the outer flakes of bark, do not last long enough to raise the sap to the requisite temperature. I recently went by trail and canoe one hundred and eighty-five miles through North Carolina long-leaf yellow pine country and was agreeably surprised to find the wire grass fields and scrub oak uplands coming up everywhere to long-leaf pine. The young pines were of all ages from first-year tufts and two-year "niggerheads" up through six, eight and ten-year saplings to young stands of twenty-five-year trees. A frightful burn had swept across forty miles of this territory ten years before, leaving, however, scattered trees which had survived to become seed trees, and these had not only seeded their immediate vicinity but the wind had enabled them to stock fields a considerable distance off. Much of this wire-grass country is burned over every year or so, yet I found many two-year and three-year long-leaf saplings with the first-year "straw" burnt off and the outer bark blackened by ground fires, and still the young saplings were in healthy, vigorous condition. In such cases examination of the cambium layer with the penknife found the fibre untainted by fire.

RAILROAD FIRE PREVENTION.

As with us, so with Europe, railroads set more fires than any other single cause. Here prevention pays more in the long run than any amount of patrol. To head off automatically the small ground fire started by a live coal and prevent it reaching the adjoining forest is worth almost any outlay, as the interest on its cost is far less than the annual cost of a really efficient patrol following behind each train. During a trip throughout Germany last year I was much interested in observing the fire protection along the railroad rights of way in Prussia, Saxony, Westphalia and Hesse. I made my trip at the end of a seven weeks' absolute drought, an unprecedented condition in Germany, yet so efficient was the fire prevention system along the railroad that in no case did I see where a fire had crossed the protective strip into the forest. They use spark arresters as with us, and here and there I saw places where a spark had gotten by and burnt quite a patch on the protective strip, but in no case did it cross over the trenches or roads to the forest front. The cost of this protective strip is placed by law upon the railroad, but its upkeep, that is to say, keeping the trenches and roads clear of pine needles, leaves and litter, falls upon the state district forester (Prussian forest laws).

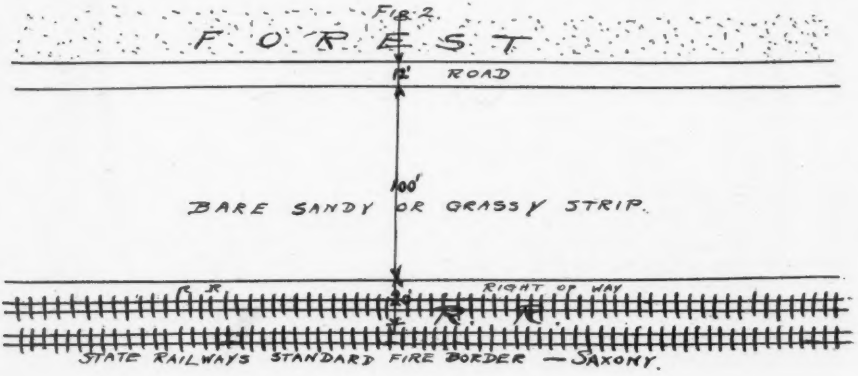
Throughout Prussia a uniform scheme of fire border, shown in Fig. 1, was used. Eight meters from the outer rail was a shallow trench dug in the clean sand four feet wide and about six inches deep. Approximately eleven meters from this a parallel trench also four feet wide and every thirty meters a cross trench three feet wide. This

Fig 1.



long rectangle, 90 feet by 33 feet, was sometimes in plain grass, more often planted thick with locust, and most often with tall *bouleau* or poplar birch. The green wall of these trees formed an effective fire wall against flying sparks being wind-driven over into the pine forests while ground fires were stopped by the trenches. Occasionally the rectangles were planted in vegetables or used for *schonung* or nurseries.

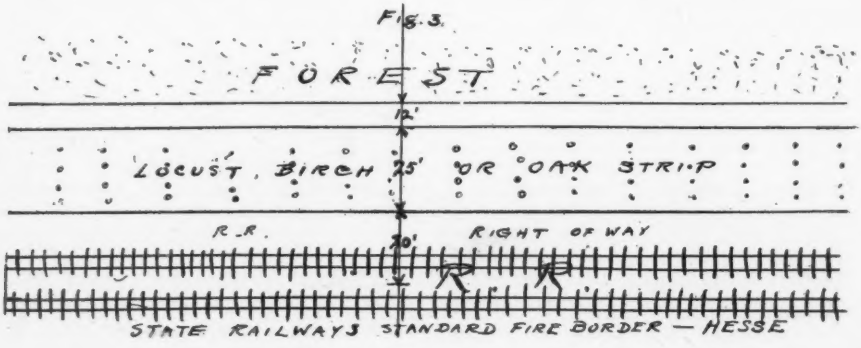
The moment one crosses into Saxony the fire border regulations change, for



the Prussian border is replaced by a clear space of 100 feet width maintained absolutely free of young growth, bushes or weeds. A fifteen foot road between the forest and the 100-foot strip stops all ground fires that may start in the grass by locomotive sparks and this road is also the terminal of all the logging and fire lanes in the forest. Details are shown in Fig 2. As the principal forests of Saxony are spruce and fir, both highly inflammable because of the thick carpet of needles and the dense black mass of suppressed branches, the Saxon state regulations are evidently aimed to give a more absolutely sure protection than the Prussian, with kiefer pine to deal with.

In Hesse and Westphalia, where there is much hardwood and only occasional spruce sections, still another regulation is in force, detailed herewith in Fig 3. Running along the right of way is, first, seven meters of clear grass, next eight meters of birch or locust forming a continuous strip and then a twelve-foot road along the edge of the forest. This arrangement showed frequent burns, some of them on steep slopes, but in no case had the fire crossed the 12-foot road.

All these schemes depend for their efficiency upon keeping the roads and



FIRE LANE IN A KIEFER FOREST (DRESDEN HARDE).

Photo by Warren H. Miller, M. F.

trenches reasonably free from leaves and litter. For this reason, with us the narrow Prussian trenches would be of little protection, but the fifteen-foot Saxon road and 100-foot clear strip would be quite effective, provided that the road was located some thirty feet from the edge of the forest so as to avoid the main bulk of falling leaves or needles. Anything wind-blown would not be apt to stop on the bare road and, with a reasonable amount of supervision by the district ranger, this road and strip would be automatic enough to obviate the necessity of a continuous patrol following each train as is now the case along many of our railroads.

A rule-of-thumb with conifers, approximately correct, is that the diameter of the crown of a tree in feet is three times the diameter of its trunk in inches in full sunlight, twice the diameter when growing in stands. A twelve-inch tree will have a crown about 24 feet in diameter or 12 feet for the length of its longest branches. Such trees in a properly managed forest ought to reach 12 inches diameter in sixty years and their crowns will overlap several feet on 16-foot centers. But, bordering a fire lane, the trees will take the full 18 feet branch length, and a 30-foot fire lane in such a forest might just as well not be there as far as stopping crown fires is concerned. In laying out fire lanes in planted forests, therefore, it is necessary to allow a full diameter of the crown additional to the proposed width of the fire lane to have it come out right. Ten foot fire lanes in young sections up to about twenty years are exceedingly common in Germany, being spaced about 300 to 400 feet apart and usually dividing sections of different ages. Allowing 18 feet for the crown of a six-inch pine or spruce, growing on the border, the rows of seedlings bordering the lane should be planted 28 feet apart.

FIRE LANE IN A TWENTY-FIVE-YEAR-OLD SPRUCE FOREST (NIEDERWALD, SAXONY).

Photo by Warren H. Miller, M. F.

Mature sections have lanes 30 to 50 feet between branch tips and are gotten by taking out the first two rows from each section bordering the lane. For a main fire stop a wide grassy strip 150 feet across is occasionally cut to prevent a big crown fire sweeping an entire forest.

In the Landes of France, planted mostly in maritime pine, a great deal of trouble has arisen because of the tendency of the fire lanes to fill with heather which makes an exceedingly hot, killing ground fire. We have the same trouble with huckleberry and sage in our coastal pine forests of the Atlantic States. The French circumnavigated the difficulty in a very ingenious and economical way by simply planting a fire *wall* instead of cutting a fire lane, and to do this they used our own American species *Q. Phellos* and *Q. Laurifolia,* the turkey oak and water oak of the Southern States. A band of sown acorns twenty-five feet wide, planted on four-foot centers, soon came up to the dense, tough, almost evergreen foliage of these two oaks. In the South they grow not only in the cypress swamps but on the high sandy ridges, along with black jack and Spanish oak, and their foliage remains green until November, returning in April. In the Southwest Coast of France they found nearly the same climatic conditions and the live fire wall not only killed out all the heather underneath but afforded an effectual wall of non-resinous green leaves for the stoppage of crown fires in the maritime Pine.

I have never seen the like in this country; the idea is worth careful thought when one is limited in funds for fire fighting. Some of our foresters are prone to rush in and pooh-pooh experiments with any idea that has been tried out across the water, but there is no reason why our more progressive element should not evolve something practical in the way of a living, green, *planted* fire wall. I have seen a disastrous Maine coniferous fire stop of its own accord when it reached a section of deciduous trees.

LOOKOUT STATIONS.

Our own developments along these lines have reached a point far ahead of

what has been found necessary in Europe, principally because our personnel has so much forest per man to guard. Particularly noteworthy is the lookout system, in use in the Arkansas National Forest, described at length in Bulletin No. 113 of the Forest Service by Daniel W. Adams, Forest Examiner. It is not sufficient for the lookout to merely discover the fire; quite as important is immediate knowledge as to its exact location and the number of miles it is distant. To get this accurately and at once, a wire cage finder is installed in each watch tower, the towers being connected by telephones. The lookouts in the various towers sight the fire through the cage wires and communicate with each other, giving the number of the wire each one sees the fire bearing upon. It is then a simple matter to plot the bearings on a fire map, kept at each lookout station, and, where the bearings intersect, as reported from various towers, is the point where the fire is located. This knowledge tells the ranger at once how much preparation he must make as to food, etc., and where the nearest fire fighting tools are cached. It may also save him a useless trip, should the intersections of the bearings occur on some farmer's cleared patch in the forest.

However, excellent as this system is, it requires a rather complete organization of the forest and one not often attained in large forests where the appropriation will not cover sufficient lookout towers, cages and telephone inter-connection. In the case of a large forest with maybe 30,000 acres to a single ranger and no adequate telephone appropriation, the same ability to locate accurately the position of the fire and its distance away in miles may be attained as follows: Each ranger is provided with a first-class surveyor's pocket compass, an instrument graduated in half degrees around its circumference and provided with folding slot sights, cost about $5.00 to $7.50. In connection with this he has a pocket map of the forest with all available lookout points marked on it,—every point where a good view may be had whether there is a built tower on it or not. Seeing a fire, the ranger sights it with his compass, getting its compass bearing from that point and draws a corresponding line on his map. All he now has to do is to proceed to the next nearest lookout point, perhaps but a mile away, and get a second compass bearing on the fire. Where these two bearings intersect on the map will give him the exact location of the fire, and with it his distance from it, the location of the nearest water to it and the nearest tool cache, all of which should be located on his map. The half hour spent in so finding the location of the fire by pocket compass bearing may save much time in directing parties to the fire and in arriving on the scene himself properly provided with rations and tools.

TOP LOPPING.

The writer was one of the members of a party which recently visited the Adirondacks on a tour of inspection of certain tracts where top lopping has been practiced for a number of years, some of the operations dating back twelve to fourteen years. The New York law requires that all tops left from lumbering operations shall be lopped, that is, the branches cut off and strewn on the forest floor, the object being to reduce fire hazard and hasten decay by placing trunk and branch in contact with the leaf mould. Under the law the rangers were required to enforce top lopping to the very tip of the crown, and, as most of it was unnecessary beyond the 3-inch diameter limit of the trunk, the lumbermen objected strenuously, even declaring the fire menace to be increased instead of diminished by lopping. They claimed that the piles of lopped tops made a hotter fire and one that would burn deeper into the duff, that the piles interfered with natural reproduction and that the alleged decay did not take place with lopped tops any quicker than with those unlopped. The commission visited a number of tracts, notably the Webb and Whitney tracts, near Long Lake West. On some of them the demonstration was, not of the efficiency of top lopping, but how tops should *not* be lopped. Piles of branches ten and

UNBURNED LOPPED LIMBS AFTER SPRING FIRE.

twelve years old lay across the trunk just where they had fallen from the lumberman's axe and the very object for which the lopping was done, reaching the forest floor, was defeated by the position of the branches on the trunk of the top which intervened between the branches and the duff. In some cases the trunk was rotted and young saplings had rooted in it while dry lopped branches lay across it. Wherever it had been properly done and the branches allowed to fall alongside the top, all trace of even the larger branches had disappeared in lumber operations six and seven years old. Smaller branches succumbed to fungus and mold in two to three years. In no case did either lopped or unlopped tops interfere in the least with natural regeneration, since the success of any seed depends more upon its finding the right combination of mineral soil, moisture and sunlight than upon any obstruction of dead branches. In the Whitney tract we were able to observe the effects of both light and heavy fires in areas where both lopped and unlopped tops lay side by side and had been attacked by the same fire. One would expect to find the closely packed heaps of lopped tops reduced to a heap of cinders, but such was not the case, for in every such pile the branches were merely charred black and the bark burned off, the fire having died from lack of support by brands underneath just the way a camp fire will if it has no fuel or bed of coals underneath. Nor was the duff badly burned, in fact, in some cases the needles underneath were still intact owing to a pile of unmelted snow having remained still under the heap of branches in the late spring when the fire occurred. On the other hand in almost every case where the fire had attacked an unlopped top it had leaped into the nearest growing tree, as many of the unlopped tops formed a wheel of branches ten to twelve feet high.

It must be remembered that these operations were of the heavy lumber type of ten or twelve years ago, whereas now the cull is at four inches, leaving a much smaller top. Even with these there can be no question that top lopping decreases the fire hazard materially and leaves a much easier slash to handle when a fire gets into it. How far the lopping should be continued is open to question; in the writer's judgment it is unessential to lop any top below the three-inch diameter limit as the out-

FIRE-PROOF TOOL SHED IN FOREST OF MARITIME PINE (LANDES OF FRANCE.)

standing branches then become no larger than one's finger and the first heavy snows crush them flat to the forest soil where decay takes place in a year or so.

In heavy lumber operations where the cull is eight to ten inches, a reasonably effective top lopping is obtained by trimming the upper branches only, as the under ones are quickly pressed into the duff and decayed owing to the heavy weight of the trunk. The writer saw many cases where all the under branches had decayed in six to eight years, while the upper ones were still intact and inflammable. While by no means as effective as complete lopping allowing the branches to fall in the underbrush, it will answer in case funds for top lopping are inadequate. The Adirondack lumber companies figure the cost of top lopping as now practiced by them at twelve cents a cord. With a 3-inch diameter limit to lopping this expense would probably fall to eight cents.

Hardwood slash makes a difficult and expensive problem of the reduction of its fire hazard. White oak slash, cut in the spring, will be dry and inflammable by October. The branches and branchlets form a huge broom which makes a hot fire, difficult of access. Owing to the great cost of lopping hardwoods, the forks and branch systems being anywhere from 6 to 3 inches thick, and owing to the more rapid decay of nonresinous woods, top lopping has been but little practiced, with the result that a hardwood slash is a notable fire trap. The writer has proposed a regulation requiring top lopping of hardwood for all branches less than two inches thick and located more than four feet above the forest floor. Such a regulation would remove practically all of the inflammable material of the tree crown and all that is below the four-foot level rapidly perishes from the dampness held in by the surrounding underbrush. It remains yet for the lumbermen to try out some such scheme for lessening their fire hazard in hardwood slash, before wise and practical legislation can be obtained.

GETTING TOOLS FOR FIGHTING FIRE IN A NATIONAL FOREST.

FIGHTING A SURFACE FIRE WITH A KNAPSACK SPRINKLER AND FIRE SHIELD.

THE OLD METHOD OF BEATING OUT FIRES.

TOOLS.

The reader will recall that in Europe fire fighting is described as still in the shovel, rake and mattock stage. Owing to the number of workers always present in the sections of a European forest, these tools will doubtless remain standard, but with us the vast areas to be guarded by a very few men require more efficient tools. As in city fires, the time element is of the utmost importance. A ranger, with his horse equipped with water-bag, saddle and spray hose, on the scene within half an hour of the discovery of the fire, is worth more than a brigade of men with shovels and rakes arriving there an hour later. The pack chemical apparatus, asbestos shield and spray hose carried by each individual fighter is excellent where one horse can serve the party with fresh chemicals and there is a brook or spring near the scene of the fire. Back-firing then becomes safe and effective as one man can be detailed to set a running fire with a torch while two or more men with pack extinguishers attend to the lee edge of the back-fire.

The special fire fighting apparatus which has grown out of the experimental work in the Arkansas National Forest may be classed as follows:

(1) Water-bag and metallic tanks for horse back and shoulder support depending upon gravity and sprinkle nozzles for extinguishing fires with water;

(2) Chemical apparatus for horse back and shoulder support, depending upon carbonic acid gas pressure for directing the water upon the fire through a straight nozzle with great force and some distance;

(3) A chemical apparatus for horse back and shoulder support, equipped with a specially designed automatic recharging device and a mixing valve and rotary nozzle to atomize the alkaline water and mix it with the CO_2.

When the water is very scarce the fire fighters have found the vapor of carbonic acid gas and water to be very effective, using a great excess of sodium carbonate and sulphuric acid over the

CHEMICAL ENGINE, FOR FOREST FIRE FIGHTING, ON HORSE.

USING THE CHEMICAL EXTINGUISHER AND THE FIRE SHIELD.

usual proportion of water. Further experiments along this line will undoubtedly develop a pure gas extinguisher producing nitrogen as the fire killer and burdening the fire fighter with chemicals only. He would thus be independent of water supplies and could carry enough chemicals in his shoulder apparatus to remain in action a long time before returning to the serving horse for further supplies.

It has occurred to the writer that the use of small dynamite cartridges such as are used for farm tree planting and ditching operations would be worthy of investigation by our Forest Service people. A trench or drain 7 feet wide and 2 feet deep can be opened in far less time and at much less expense than hand labor by planting a line of dynamite trench cartridges at 28-inch intervals and firing them in succession as their fuses burn down. In the same way a line of men clearing a fire line ahead of a big fire often find themselves caught up with before the line is complete, with the result that the fire gets across at the unfinished points and the whole job has to be done over again at a new line. In a crown fire sometimes the immediate felling of a single tree would save the situation, but there is no time for the axe to do its work. It is easy to throw a tree, or a line of trees, with dynamite and if suitable sizes and quantities of these cartridges were included among the fire wardens' resources much could be done in emergencies. These cartridges are supplied with ordinary fuses and require no electric apparatus to ignite. To throw a tree is simply a matter of driving a hole in the duff, dropping in a cartridge and touching off the fuse. And, where time presses along the firing line, a long strip can be cleared in a few moments by planting a line of cartridges two feet apart and touching them off. The Du Pont Powder Company report considerable progress in their experiments now being made along these lines and this matter is well worthy of investigation by our forest supervisors.

The proposal by the Camp Fire Club to create game refuges of several thousand acres around certain lookout sta-

TESTING CHEMICAL ENGINE ON A BURNING TREE SNAG.

tions in the Adirondack Preserve is noteworthy, as it interests in the welfare of our forests a body of influential citizens whose help should be more than welcome,—our sportsmen. Nine-tenths of all the beneficial game legislation enacted is originated by the sportsmen's organizations, while all of the measures destructive to forest and wild life may be traced directly to selfish special interests. Of late the sportsmen have been interesting themselves directly in the forests and forest legislation, for without forests there can be no game. The creation of refuges around forest lookout stations under the general supervision of the ranger, adding to his pay that of deputy game warden, gives the sportsman the strongest incentive to lend his support and interest in all forestry matters, makes him a volunteer fire fighter and doubles his care against setting fires in any forest where the game refuge itself might be consumed. It has been conclusively demonstrated that game refuges, even with no further protection than a line of placards, are exceedingly effective in protecting and propagating wild life, and they are not likely to be trespassed upon if the poacher knows that the whole district is under the eyes of the rangers in the lookout station. As an incidental means for fire prevention game refuges should not be overlooked in our state and national forests.

TIMBER RESEARCH WORK IN ENGLAND.

The first quarterly progress report on timber research work of the School of Forestry of the University of Cambridge is out. It forms a twelve-page pamphlet and is the work of E. Russell Burdon and A. P. Long, investigators in timber. The principal report deals with an investigation of Scots pine, in which the field work and timber work are succinctly described. An account is also given of visits to wood-using industries in the neighborhood of the woodlands under inspection.

FOREST CONDITIONS OF NOVA SCOTIA

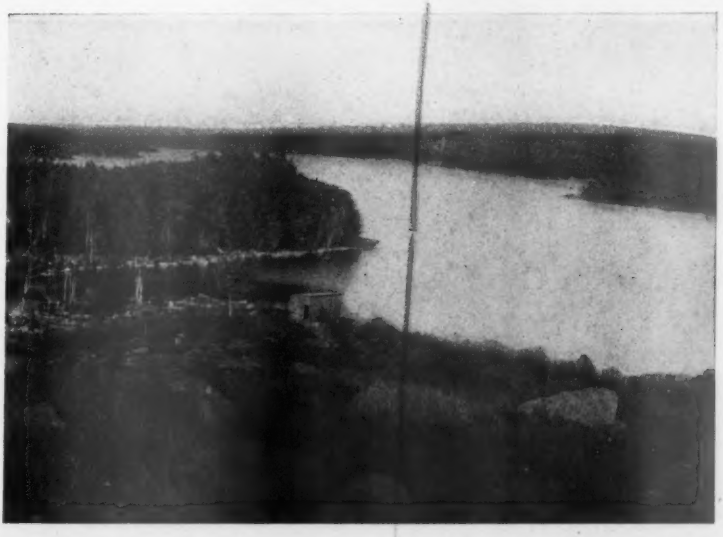
By B. E. Fernow, LL. D.,

Dean of the Faculty of Forestry, University of Toronto

THE most obvious and general reason for ascertaining the extent and conditions of the forest resources of the Province of Nova Scotia—and every province should follow the same enlightened policy—is that it appears foolish to administer or prescribe regulations for a property in ignorance of what it is. This applies to public property as well as to private. Ignorance of the assets of the province as a whole, as well as of the conditions of the remaining Crown lands, becomes, in time, inexcusable. The Government is certainly justified in ascertaining these conditions, for it alone can do so satisfactorily, and it alone is, or ought to be, concerned in every acre of the Province, be it owned by farmer or lumberman or by the Province itself.

In the reconnaissance, the following points were generally ascertained in detail: the composition or type of forest; the degree of culling; the extent of burnt areas; the condition of reproduction; the character of the barrens; the natural meadow lands; and the cleared lands. Incidentally, for the purpose of arriving at tenable average figures, the stumpage of different parcels was ascertained, and also some studies on the rate of growth in culled areas were made. Dr. Howe has also analyzed a series of soil samples as a basis for his discussion on their fitness for forest growth.

In large farm areas no precise separation of the woodlots was attempted. Especially along the water front, fields and woodlots present a very mixed condition. Here a general estimate of the percentage of wooded area within the



ONE OF THE INNUMERABLE LAKES ON THE GLACIATED GRANITIC AREAS.

MIXED FOREST, SUGAR MAPLE, YELLOW BIRCH, BEECH, RED SPRUCE WITH FIR ON THE MARGIN OF THE LAKE. NEARLY THREE-FOURTHS OF THE FORESTS OF NOVA SCOTIA ARE OF THIS TYPE.

THE CREST OF THE GRANITIC AXIS MAY BE SEEN IN THE DISTANCE. NEARLY ALL THE SLOW-FLOWING RIVERS HAVE EXTENSIVE NATURAL MEADOWS.

farm district was made, and added to the woodland area.

In order to reduce the great variety of forest conditions which are met wherever a man has interfered with Nature's work to a manageable number for statement, three grades were usually recognized, namely "severely culled," when more than half the timber was removed; "moderately culled," when not more than one-third to one-half was removed, and "virgin," when no timber, or only the pine and heaviest spruce had been removed in earlier times. Similarly, the reproduction, that is, of conifers, was noted as good, medium, or poor, and areas of young or second growth were specially noted.

It should be acknowledged that the distinction of severely culled and moderately culled condition could not be made a very definite one, and in given single cases the classification would often be doubtful. In the general averages, however, errors will be largely compensated, with a tendency, no doubt, to increase the acreage of the more favorable condition beyond the actualities. The object of the classification will, on the whole, have been attained, namely, to give an idea as to the promise of producing capacity of the forest.

On burnt areas, the recent fires, and those of earlier date, were separately stated, so as to give an idea of their probable recuperation. Wherever ascertainable, the exact year of the fire was noted.

In some places, fires have repeatedly swept over the same area, creating veritable barrens. These were specially noted. In other places, fires sweeping over large areas would leave patches of timber standing,—patches which were, however, too small to make their exact situation and extent worth ascertaining. In such cases, the whole region was indicated as burned over, but with a sign denoting the existence of green patches, and an estimate of the amount of such green spots was made.

The barrens, a term applied promiscuously to territory relatively unproductive, of which there are large areas, form a most interesting object for ecologic and economic study. There are at least six types of barrens, some of them natural barrens, others made by man, some doomed forever to remain in unproductive condition, others capable of redemption, either for timber or pasture. Most of the reputed Crown lands are in this condition, and a closer investigation, and experiments to find out the best way of making them useful, would be proper.

THE INTERIOR OF A PURE STAND OF DECREPIT HARDWOODS FORMED BY THE REMOVAL OF RED SPRUCE, BEECH, HARD MAPLE AND YELLOW BIRCH. CHARACTERISTIC CONDITIONS ON SOILS OF MEDIUM DEPTH ON THE MOUNTAINOUS REGIONS THROUGHOUT NOVA SCOTIA.

MODERATELY CULLED RED SPRUCE FOREST IN NOVA SCOTIA. NOTE THE TWO GENERATIONS INDICATING TWO FUTURE CROPS.

The belief is abroad that all the barrens are the result of repeated severe fires. Dr. Howe's interesting special study, which forms part of this report, should go far to dispel this belief; for his conclusions are based on investigation, and not merely on opinion or belief. While fire is, or may be, the true explanation in some cases, and while probably all barrens have been burned over at some time, this is certainly not the cause in other cases, which are demonstrably the result of natural causes. The barrenness in these latter cases will usually be found to be due to character of soil and to either excessive or deficient drainage, rock barrens, swamp barrens of several types, and real heaths. The barren region, composed mostly of ungranted lands, which is located around the common corner of the four counties, Digby, Yarmouth, Shelburne and Queens, and in the southwest corner of Annapolis, is very likely, to a large extent, a result of repeated fires. It exhibits, however, the greatest variety of conditions, and, like some of the burned areas referred to, contains blocks or islands of green timber, either swamps or hardwood hills, or stands of pine, occasionally of good development. No attempt was made to locate these islands, except where owned by grantees, the lack of tie-lines forbidding the attempt.

As regards composition of the forest, the great variety was reduced to three types, namely pure hardwoods, pure conifers, and the mixed conifer and hardwood type. Purity, to be sure, is only relative, since there are rarely to be found absolutely pure stands. To constitute the last, or mixed type, an admixture of either hardwoods or conifers to the extent of at least 20 per cent. numerically (trees, not logs) would be necessary. To denote the relative prevalence of the different species in any of these types, these were noted in parenthesis, in the sequence of their predominance, so that, if needed, further differentiation into sub-types would be possible.

As regards the prevalence of certain species in different localities interesting data were gathered. Especially the three important conifers, pine, spruce, and hemlock, while they occur everywhere, exhibit more or less localization. Thus, for instance, Annapolis County can be called the hemlock region, this species forming 60 to 70 per cent. of

A CHARACTERISTIC BARREN OF THE SANDY OR GRAVELLY SOILS. BURNED IN 1878. NO REPRODUCTION OF COMMERCIAL SPECIES.

many of the uncut stands. The interior of Digby also is largely hemlock country, while the shore lands are spruce country, this species forming perhaps as much as 75 per cent. of the forest. Shelburne and parts of Queens are largely pine country, while Cape Breton Island is a veritable fir country.

The estimates of cleared land or farm area were purposely made liberal so as to include as much as possible of the potential farm area. As stated before, it was difficult to draw the line between pasture and woodlot; nevertheless, considering the differences in method, a remarkable coincidence with the figures of the Census of 1901 is found, a fact which will increase confidence in the general result of this survey. The Census figures—which, it must be understood, are also merely estimates leaning the other way—are, by somewhat less than 3 per cent., below the survey findings, *i. e.*, less favorable to the farm area. In three counties only did the survey arrive at lower figures than the Census, namely in Annapolis, Yarmouth and Antigonish, and these, especially the latter, were found to have many pastures growing up to wood, perhaps since the Census year, which would be classed under young growth. It is quite safe, then, and a liberal estimate, to state the total farm area at less than 20 per cent.

While there are still areas under forest which are fit for farm use, the present farm area includes probably as much unfit land which is gradually reverting to forest, so that, on the whole, the acreage of the farm area is not likely to change much.

As stated before, the natural meadows and savannas must eventually be added to the farm area, but they represent less than 60,000 acres.

The actual green forest area consisting of some five million acres and stated as occupying 52.5 per cent. of the area of the Province, must, on the other hand, be increased by the potential 5.8 per cent. of the recently burned area and by nearly 12 per cent. of the better class barrens which can eventually be reforested, so that the actual and potential forest area may be set down as representing 70 per cent. of the land area. The balance, only some 10 per cent, is hopeless barren. This is a rather small percentage for waste land, and only conservative treatment of the woodland area, protection against fire, and recuperative measures in the old burns and hopeful barrens, will keep it there.

Less than 100,000 acres of virgin, or semi-virgin, timber remain, and, altogether, not over 1,400,000 acres, one-quarter of the green forest area, are furnishing the log supply of the present mills, with a small addition from the 2,800.000 acres of severely culled forest and the 227,000 acres of second growth.

Of the green forest area, pure hardwood forest is represented by less than 7 per cent., and pure coniferous growth by 20 per cent., the bulk of the forest, namely, 73 per cent, being of mixed type. With the culling of pine, spruce and hemlock from the latter, there is, of course, the tendency to give the ascendancy to hardwood. Hence, the severely culled areas are apt to grow into hardwoods, and probably a considerable area, noted as pure hardwoods, was originally mixed growth from which the conifers have been removed. The two types of virgin and moderately culled hardwoods were combined, the differentiation being practically unnecessary.

OWNERSHIP CONDITIONS.

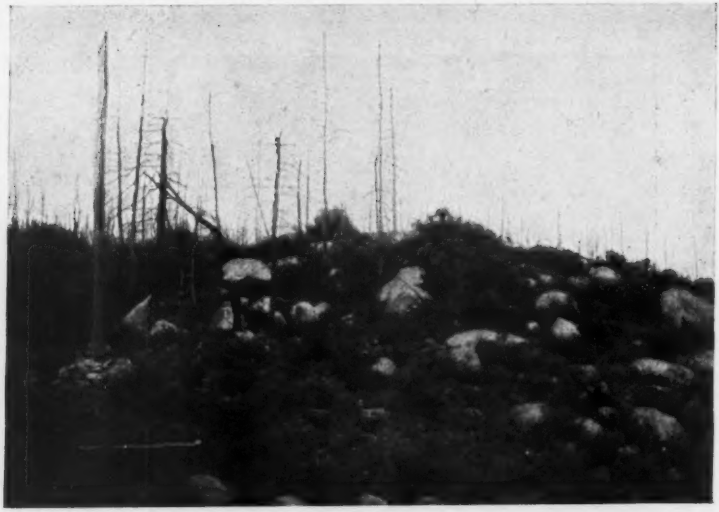
We may briefly refer to ownership conditions as being influential in attempts to secure a conservative use of the forest resources.

Unlike other Provinces, the Government of Nova Scotia early adopted the policy of disposing of timber and land at a price per acre, the object being to encourage settlement of the country, no matter whether farm or forest land was taken. Not until 1900 was this policy changed to one of leasing lands for the removal of timber under leases running for twenty years, subject to renewal, at not less than 40 cents an acre for the term. The price, later, was changed to 80 cents, the lessee being entitled to take all timber of not less than 10 inches in diameter. But the Government is also empowered to lease on other terms

WIRE BIRCH (BETULA POPULIFOLIA) THICKET, TWENTY YEARS AFTER A FIRE.

WIRE BIRCH (BETULA POPULIFOLIA) THICKET, TEN YEARS AFTER A FIRE.

THE CONDITIONS REPRESENTED BY THESE PLATES EXIST ON 1.9 MILLION ACRES, OR NEARLY ONE-FOURTH OF THE PRESENT FOREST AREA OF NOVA SCOTIA.



REPRESENTS THE PREVAILING CONDITION ON THE BOULDER-STREWN GRANITIC AREAS. THE REPRODUTCION OF COMMERCIAL SPECIES IS CONFINED TO THE MOIST DEPRESSIONS.

when land of inferior quality is involved and manufactures are to be established.

The law of 1900 authorizes the repurchase, at not less than 25 cents an acre, of lands granted in fee simple. Unfortunately the Government did not take advantage of this authority, and the Act was repealed in 1910. Under the policy of sale, all the land but about 1.5 million acres was disposed of, largely in small parcels, with a few grants of larger extent. A number of grants were issued to soldiers, the majority of which probably were never occupied by them. After the best timber had been thus disposed of extensive grants were made to railway and mining companies—notably the Nova Scotia Railway Company—which often were no better in character than the lands still held by the Crown.

Some large operators and corporations have acquired and combined numbers of smaller grants and, at present, probably little less than half the timbered area is owned in large holdings of 10,000 to 250,000 acres in extent, the other, and larger, half being owned in holdings which rarely exceed 1,000 acres.

Small portable and water mills are a quite frequent feature.

It appears that, contrary to the usual experience, the small ownership is the more conservative one. The large operators, being forced to cut large quantities, do not have the same chance of lumbering conservatively, which the small owner has who personally superintends his cut. At any rate, it is worth noting that many of the small owners treat their woodlots with care, cutting to a diameter limit in selection, and even "downing" the brush.

The character of the Crown lands, as stated before, places them largely in the class of barrens and semi-barrens. Yet, there is enough of present and prospective value in them to call for closer investigation and conservative management, and the Government undoubtedly is under prime obligation to consider such management.

RECOMMENDATIONS.

Finding that 80 per cent. of the Province—when not barren—is forest country and practically destined to remain so, it would appear rational for Government and people to put forth every effort to keep the same in productive

condition. Here is a natural resource capable, under proper management, of forever producing, by annual increment, as interest, at least twice as much as is now being cut from capital stock; a resource which, basing its value on reasonable rates of growth, both of wood and of wood values, may reasonably be stated as representing a potential capital of at least $300,000,000. It is now largely in poor condition, and is being, annually, further deteriorated by abuse and injudicious use, because those owning it are mostly not concerned in its future, or do not realize its potentialities. To arrest further deterioration and to begin restoration is the present duty of those who have the continued prosperity of the Province at heart.

The first, most needful step towards a change from past neglect has already been taken in the enactment of legislation to protect the forest properties against fire, and in inaugurating the beginning of a suitable organization for carrying out its provisions in co-operation between the Government and the timberland owners. This organization should be extended and perfected until the fire danger to forest property has become as remote as to city property. This is practically possible in Nova Scotia, where the populational conditions are most favorable, inasmuch as the country is almost everywhere settled and accessible, and owners of woodlots or small timber tracts are distributed throughout the country. Fire watchers and fire fighters are, therefore, nearly everywhere available on short notice. There is no reason why in a few years of earnest and determined effort, by an educational campaign and by efficient protective service, the destruction of forest by fire should not be reduced to a rare accident. Only when this is accomplished will it be reasonable to resort to methods of recuperation.

To further reduce the chance of destructive fires, the propriety of lopping tops in logging operations, if not burning the same, as a reasonable protective measure, should be seriously considered.

As to details of practicable measures in this direction and otherwise, I may refer to a report by the Committee on Forest Fire Legislation of the Canadian Forestry Association, lately issued.

I would recommend its study especially with regard to the provisions for making land along railways safe and

REPRODUCTION AFTER A BURN TWENTY YEARS OLD. THE SOIL IS FINE SAND TO THE DEPTH OF ONE FOOT; BENEATH, A CLAY SUBSOIL.

REPRODUCTION AFTER A BURN TWENTY YEARS OLD. THE SOIL IS FINE SAND TO A DEPTH OF THREE INCHES, THEN COARSE SAND AND GRAVEL FOR EIGHT FEET, TO A CLAY SUBSOIL.

the railways liable for the fires they set out, and also as regards suggestions with respect to the erection of watch towers, the issue of permits for setting fires in the woods, the lopping of tops, the burning of brush, and the proper organization of a fire fighting force.

Next to protection against fires, improvement in logging methods with proper regard to young growth should be secured. The aim of the logger, at least, should be not to prevent the efforts of Nature to restore the cut-over lands to useful production. This is a matter of complex nature, for which no general prescription can be given, each case requiring special diagnosis locally, and special expert advice; and it is also a matter of education to secure the application of the advice. As an expression of its educational function, the Government should establish a technically educated Provincial Forester, whose business it should be to study the situation in the various localities and act as public adviser or instructor—a wandering teacher.

In this respect the recent institution of Conservation Boards in Sweden is most suggestive. In that country, for every province or county, a local board of three members is established to promote forest conservation. The board consists of one member appointed by the Government, one elected by the County Council, and one elected by the County Agricultural Society; and additional members may be elected directly by the people. This board chooses a technical adviser from the State Forest Service whose salary is paid by the Government, which also raises the funds for the use of the board by the imposition of a small duty on wood exports.

It is left entirely to the discretion of the board how these funds are to be applied in executing the law for furthering the forestry interests, with the mere injunction that a conservative treatment of the woods must be enforced, and that regeneration or reforestation must be attended to. The board, working under the County Council, has the power, however, to enforce its rulings in the courts by injunctions, money fines, confiscation of logs, etc.

Naturally, at first, different boards construed the law differently, and applied the funds in different ways, which

A GRANITE ROCK BARREN, THE PREVAILING CONDITION ON THE MAIN MOUNTAIN AXIS IN GUYSBOROUGH COUNTY, N. S. THIS AREA WAS NEVER BURNED.

was undoubtedly intended by the law, in order to give scope according to varying conditions. There are, however, three directions in which eventually all have come to work, namely, education, assistance, and police regulations.

In one of the provinces the forestry expert gives three separate technical courses of instruction to woodland owners, each lasting about two weeks, namely two in the autumn on silviculture and on mensuration, and one in the spring on draining—the utilization of the many peat bogs being an important problem; and this problem is also an important one in Nova Scotia. Two lectures a day and six to eight hours demonstration in the field is the time given to these courses in which some four or five forest rangers assist at the demonstrations. The board pays the living expenses of those attending. The number admitted annually, out of the 80 to 90 applications, is 50; in five years some 200 or more men attended these courses. In addition, literature of a popularly written but technical character is distributed. Sometimes this instruction is given in combination with high schools or county schools.

To those who ask for special advice in the management of their properties it is given by sending an expert on the ground. To those who desire to plant waste lands or old clearings, seed is furnished up to 50 pounds, at one-tenth of its cost, and other plant material may, under certain circumstances, be supplied free of charge.

The owner has a right to cut as he pleases, but, if natural regeneration fails to appear he is obliged to plant, the board determining when the necessity for such planting has arrived. If the owner objects to the decision of the board, a special inspection is ordered, the expense of which he must pay, and at the same time he loses all claim to assistance. Although the power of the board is great, the policy is to secure co-operation rather than to use force. By this time, owners have learned the advantages of these arrangements, and only speculators make trouble. I have described this institution at length, because it is thoroughly democratic and is, with minor changes, immediately applicable to Nova Scotia.

EXAMPLES OF SEVERELY CULLED FORESTS. MATURE PAPER BIRCH AND SCATTERED SAPLINGS OF RED SPRUCE REMAIN. NOTE THE THINNESS OF THE SOIL—FIRE TRAPS.

For Nova Scotia, the appointment of at least one expert to attend to this educational campaign in co-operation with existing or specially constituted local authorities would be a step in the right direction. The appointment of a Provincial Forester—as has been proved in the several States of the Union, where they have such officials—would immediately result in an awkward interest in the possibilities of improved methods of forest use, and from what we have seen and heard during the progress of this survey, the woodland owners will be found ready to follow his advice.

With such a Provincial Forester the Government would also be enabled to find out what is the best policy to pursue with regard to the remaining Crown lands. Their extent, exact location and condition should, of course, first be ascertained, and in their management, considerations of their future, rather than their present, value should dictate the policy. If the Government cannot manage its property conservatively, who will?

Lastly, perhaps in conjunction with the Agricultural College and Experiment Station at Truro, the Provincial Forester should conduct an investigation into the question of the use and restoration of the barrens, and should make experiments in improving natural meadows and savannas, and in forest planting on areas fit for such planting.

We hope to have shown by this survey that the forest resources of Nova Scotia are an important factor of the industrial economy of the Province, that they are liable to exhaustion in the not distant future, that they are capable of being perpetuated by more conservative use, and that it is high time to provide for such perpetuation.

In conclusion, I may be allowed to say that in no portion of this Continent, and of the Dominion in particular, are the chances for the immediate inauguration of a definite practical forest policy so favorable as in Nova Scotia, and this is so because of the presence of an intelligent, well-distributed population.

*Extracts from a report based on information gathered from a reconnaissance forest survey under the direction of Dr. Fernow, and published by permission of the Department of Crown Lands, Nova Scotia.

A SWINDLER CAPTURED.

A young man giving the name of Fred Boley, who has been securing money from members of the American Forestry Association on the plea that he is a relative of one of the association's officials, is a long way from home and has lost his return ticket, was arrested in Chicago on May 27. A circular letter sent by the secretary to the association officials resulted in Mr. J. E. Rhodes, of the National Lumber Manufacturers' Association of Chicago, on whom the young man called, capturing him. He will be brought to Washington, D. C., for trial.

A FINE FORESTRY EXHIBIT

A GREAT deal of credit is deserved by the Pennsylvania State Forestry Association for the forestry exhibit at Horticultural Hall in Philadelphia during the week of May 19, an exhibit which was one of the most successful of its particular kind ever held in this country. The exhibitors presented practically every phase of forest condition, the best method of protecting the virgin forests from fire were shown; the most scientific method of lumbering was being explained; features of reforestation following a cutting of marketable timber were to be seen; replanting of denuded areas was described and illustrated; all kinds of American woods were on display, and so were most kinds of forest products. There were also shown collections of the insects which prey upon the trees, and other insects which prey upon these tree pests; there were exhibits showing the uses to which woods are put, and others showing how forest students are trained, and still others showing the animal and bird life in the forests.

There were some which gave particular attention to forest conditions in Pennsylvania, each of the forestry organizations of the State being represented by very complete displays, and others representing conditions throughout the United States, such as the Forest Service, the Reclamation Service and the American Forestry Association.

Space does not permit a detailed description of each of the exhibits. The fact that throughout the twelve hours each day that the hall was open there were seldom times when there were not clusters of visitors at each exhibit attests their attractiveness, both from an instructive and an entertaining viewpoint.

One feature worth special note was that each day hundreds of school children were brought to the exhibit and were deeply interested in what they saw and in the explanations of the forest conditions. There were implanted in the minds of most of them fruitful seeds of thought which should, as they grow, develop them into practical forest conservationists.

Aside from the exhibits themselves there was instruction to be had from some of the most eminent forest conservationists in the country at the addresses which were given in the hall each afternoon and evening. These lecturers and their subjects were as follows:

Dr. Henry A. Surface, Economic Zoologist of Pennsylvania, "Some Forest Pests and Their Treatment."

Prof. J. A. Ferguson, Dean Department of Forestry, Pennsylvania State College, "What Forestry Can Accomplish."

Dr. John W. Harshberger, Professor of Botany, University of Pennsylvania, "North American Forests; Their Evolution and Distribution."

Professor N. F. Davis, Bucknell College, "Use of Waste Land for Raising Chestnuts."

Irvin C. Williams, Deputy Commissioner of Forestry, "Diseases of Our Forest Trees with Special Reference to the Chestnut Blight."

Professor Henry S. Graves, U. S. Forester, "The National Forests."

S. B. Elliot, Pennsylvania Forestry Reservation Commission, "Forestry and the Lumber Industry."

Witmer Stone, President Audubon Society, "Forest Preservation in its Relation to Wild Bird Life."

Dr. J. T. Rothrock, Secretary Pennsylvania Forestry Reservation Commission, "Desolated Pennsylvania."

Several thousand people visited the exhibit during the week, heard the lectures with deep interest, viewed the displays of the various forestry organizations and associations and carried away with them a new belief, or a deeper belief, in the vital need of forest conservation, not only in Pennsylvania, but throughout the entire country.

AMERICAN FORESTRY ASSOCIATION EXHIBIT AT THE PENNSYLVANIA FORESTRY ASSOCIATION FOREST EXHIBITION IN PHILADELPHIA.

THE CEDAR OF LEBANON*

By Geo. V. Nash

A MAGNIFICENT example of this interesting tree, on the estate of Mrs. Collis P. Huntington, at Throgg's Neck, New York City, is shown in the accompanying illustration. This specimen is in full vigor, although over one hundred years old, standing sturdy and strong, with many years of life before it, unless the hand of man should cut short its career. This tree is about seventy-five feet tall, with a maximum spread of branches of about sixty-five feet. The branches have a peculiar flat shape, giving a sort of terraced effect to the foliage. Judging from illustrations, the tree on the Huntington estate equals, if it does not exceed, in beauty and dignity any of those in cultivation in Europe. Imagine the dark green foliage, the tall straight trunk over four feet in diameter, and the broad spreading branches extending to the ground, and you have a picture of this tree as it now is. It has stood there for one hundred and twenty-three years, having been brought to this country, so the story runs, from Palestine, in 1790, by Philip I. Livingston, the former owner of the present Huntington estate, and a great lover of the choice in horticulture in his day. Then but a small tree, it has flourished in its present site until it now bears the reputation of being the finest specimen in this country. There are other smaller trees in Central Park and Prospect Park. Another was planted at Woodlawn, near Princeton, N. J., by the late Judge Field in 1842. This was thirty-six feet high in 1859, and thirty years later it had attained a height of fifty-four feet and a trunk diameter of a little over two feet. Another fine specimen was on the grounds of the old Prince Nursery at Flushing, N. Y., which in 1889 was about sixty-five feet high.

This would seem to indicate that this tree is hardy from the latitude of New York City south. Perhaps it is the favorable location of the trees at Throgg's Neck and Flushing near the waters of Long Island Sound which may account for their vigorous growth and long life, but an effort to cultivate it in this vicinity would certainly be worth while. Its magnificent proportions, as shown in the illustration, would make it a desirable acquisition in any park.

The specific name *Libani* refers to Mt. Lebanon, with which this tree is associated in biblical history. For centuries it was believed to be confined to the Kedisha valley at an elevation of about 6,000 feet. This valley is about fifteen miles from the Syrian port of Beirut. Many travellers from western Europe had visited this valley in the few hundred years past, the reports brought back by them indicating a gradual diminishing of the number of trees. A scientific investigation of the conditions at Mt. Lebanon was finally undertaken in 1860 by Sir J. D. Hooker. He found that there were about four hundred trees in the valley, covering an area some twelve hundred feet in diameter, with one or two outstanding trees not far from the rest. They formed nine groups located on as many hummocks of the moraine on which they occur. They varied in size from six inches to thirteen feet in diameter. The smallest trees he was able to find were of the small diameter mentioned above, indicating that favorable conditions for the germination of the seed must occur at great intervals.

Since that time many other localities have been discovered, and it is now known to occur commonly on Mt. Lebanon, chiefly on the western slopes, in detached groves, in some cases comprising several thousands of trees. Vast forests of it are also known on the higher slopes of Mts. Taurus and Anti-Taurus in Cilicia. Here it grows

CEDAR OF LEBANON STANDING ON THE ESTATE OF MRS. COLLIS P. HUNTINGTON, THROGG'S NECK, NEW YORK CITY. FROM THE JOURNAL OF THE NEW YORK BOTANICAL GARDEN.

between 3,000 and 6,000 feet altitude, occurring at the lower elevations with *Abies cilicica*. In 1897 Walter Siehe, in a report upon the conifers of the Cicilian Taurus, says that the Cedar of Lebanon occupies the higher slopes where snow lies several feet deep for nearly five months of the year. The forests, he further relates, are of impressive grandeur, the intense stillness only broken from time to time by the cry of the alpine crow, or by the crash of a mighty boulder, started in its descent by the passing of some wild goat. He reports the wood as highly prized in that region, being strong, and possessing the quality of exposure to the weather without warping. It is also fragrant and free from the attacks of insects. It is used for the interior woodwork of the Greek churches, and for the manufacture of the better kinds of household furniture. This is exactly the reverse of the opinion held of the wood of these trees grown in England, where it is reported as "light, soft, brittle, apt to warp and by no means durable." This difference may be due to environment, the greater altitude and the presence of the snow blanket in its native home accounting for it.

That this is the cedar of Lebanon of the Bible there seems some doubt, for those on Mt. Lebanon are some fifteen miles from the coast, so that they could have been transported to Jerusalem only with the greatest difficulty and expense. Be this as it may, during the sixteenth century it became the custom to make pilgrimages to the cedars of this mountain. The pilgrims carried away so much wood for the construction of crosses and tabernacles that the religious authorities of that time put a stop to it by threatening excommunication to any one who injured the trees. The rigor of this edict was only remitted on one day in the year on which was celebrated the Feast of the Cedars, when an altar was built under one of the largest and oldest trees.

The cedar of Lebanon was introduced into cultivation in England about 1683, according to Aiton, when the trees were planted in the Chelsea Botanic Gardens. Its first appearance in France was in 1734, when a tree was planted in the Jardin des Plantes. If report be true, its first introduction into this country was in 1790, by Philip I. Livingston, as indicated at the beginning of this article.

Here at the Garden we have under cultivation in the pinetum two of the three known species of the genus *Cedrus*. These are the Mt. Atlas cedar, *Cedrus atlantica*, of northwestern Africa, and the Deodar or Indian cedar, *Cedrus Deodara*, of the Himalayan Region. Specimens of both will be found on the ridge in the vicinity of the economic garden but a short distance southeast of the museum building.

May this noble specimen of the Cedar of Lebanon, now standing in stately dignity on the Huntington estate, the beloved and prized of all tree-lovers, be preserved to us for many, many years. Its destruction would be not only a loss to its immediate neighborhood, but to the whole city and the country wide, for a tree of this kind has much more than a local interest. All tree-lovers know of this wonderful specimen, and value it as one of the choicest and rarest representatives of arboreal vegetation in this country.

AN ARGUMENT FOR FOREST PLANTING

By Montgomery Rollins

IT seems somewhat strange that the scientific foresters are not more practical on the subject of finance, and that they fail to recognize that the farmer, as a class, is one of the most practical financiers whom we have produced. He has learned, by hard knocks, the value of a dollar. He has learned, in innumerable instances, through mortgage indebtedness, what interest means, and the true worth of money. The average rate of interest paid upon farm mortgages throughout the United States will certainly be six per cent or higher.* To the farmer who has been educated to the custom of paying such a rate, an investment rate of three or four per cent must seem ridiculously meagre. This accounts for the freedom with which they have been small but direct investors in bonds and stocks. They use the savings bank upon an entirely different plan from the mill operative, or other accumulator of funds earned by the sweat of the brow. The former puts his money into the savings bank, either so he can have it conveniently at hand, in case of need, or until it shall have increased to a sum sufficient for investment purposes.

If the foresters better understood the money and investment habits of the farmer, they would at once see that the argument, so freely put at him, that it is a good investment to grow a forest to be lumbered years afterwards, is as wasted as dumping a pound of sugar into the Atlantic Ocean. The estimated four or five per cent income return, to be garnered a generation hence, is but little inducement to the tiller of the soil, who, as already suggested, has been paying six per cent or more on mortgages, or who has been used to investments returning him nearly or fully as much—for he often has a mortgage upon his neighbor's farm or chattels, and can today buy what he deems good preferred stocks yielding him in the neighborhood of six per cent, or such high grade shares as those of the Pennsylvania Railroad netting over five per cent.

The writer ventures the rather sweeping statement that the farmers—and by "farmer" is not meant the city man of means who is dubbed an "agriculturalist," but the genuine inheritor of the soil—who have been influenced into preserving their standing timber, or planting new growth for the reasons advanced by the foresters, are not worth discussing. There must be some other argument put forth to convert them, or conceived in their own minds, which it is believed may be this:

No one questions that the foresters are fast disappearing; especially is this true of the small, scattered wood lots throughout the strictly agricultural districts, and it is that section in particular to which this article applies. For it is the simon-pure farmer to whom we are talking; not the owner of wild timber land. We are a very fast growing country; our population is increasing at a stupendous rate. A Japanese, of broad reputation, predicts a population of two hundred millions for these United States within a time so little distant as to startle the casual economist.

Along with this growth in population is a like astounding growth in wealth. Each era of prosperity is graduating thousands of wealthy men from the ranks of industry, whose first thought is often the desire to possess a country place. Some are turning to the seashore, but, to revise a well-worn

*Recent investigations by the United States Government show the average rate paid by farmers throughout the country for short time loans—three to six months—to be seven and three-quarters per cent.

expression, a bountiful Providence created a very limited amount of shore land, so its area is naturally curtailed.

The writer would also call attention to another great change which has come over our population: The vacation seeker, through golf, automobiling, and other out-of-door sports, has become more and more interested in open-air life, and feels the need of a breathing spot to which to retire at week-ends, throughout the year, rather than to possess a place available for the summer months only, which is about all that can be claimed for a seashore cottage.

As the land areas obtainable at reasonable prices are much restricted adjacent to the coast, large tracts for shooting preserves, or the like—which are now in demand—are practically out of the question. We seldom think of an Englishman as going to the seashore, but always as going to the country. Following this thought, it is not wide of the mark to repeat the idea that Northern New England and New York will eventually be, and are fast becoming, the "Highlands of America."

One thing more in this same connection: The coming of the suburban and interurban electrics redistributed the population, by making the territory closely tributary to these lines available for suburban or country homes. Now comes the automobile—that wonderful machine, both liked and detested, but certainly becoming one of the great influencing factors of the age. Through this, we shall accomplish another redistribution of the population. At first, the running of these cars through the winter season was deemed a practical impossibility, but, to a great extent, this problem has now been successfully solved upon roads of stable foundation. On good macadam roads there is little trouble in operating a motor car during all but an inconsiderable part of the winter in much of our snow-covered North.

That we shall get these roads throughout the country at large, starting first with the main arteries, and then the important branches, is being proved by the work which is actually under way. Maryland, New Jersey, New York, Massachusetts and New Hampshire have already appropriated millions for this purpose; and the recent legislatures in other States have provided liberally for the same ends.

New Hampshire is building upon broad lines, for it is constructing three "trunk roads," one up the Connecticut Valley upon the West, another along the coast and up the Salmon Falls and Saco Valleys upon the East, and a third up the central part of the State, all beginning at the Massachusetts State line, and converging towards the North and connecting in the White Mountains. New Hampshire has been somewhat slow to undertake this work, although the scheme was carefully devised, planned and laid before the public as far back as eighteen hundred and ninety-nine. For the governor of that State, at that time, was one of the very early pioneers in the thought that the State would eventually be developed by such a series of trunk roads, and advocated exactly this same three road system now so tardily enacted into law. He even went so far as to predict that—even though it was before any practical development in automobiles—good country inns would spring up along those highways at convenient distances to welcome and comfort the traveler. How true were his predictions can now be seen, for these matters are, indeed, well on their way to fruition.

There is a great social change or movement countryward. Through this means the best and truest preservation of forests is being accomplished; namely, actual purchase by the so-called and often unappreciated "summer resident." This unfair name will gradually disappear. He will cease to be a summer resident, in its literal sense, for, through owning cows, horses, and desiring to have his country place accessible the year around, it will never be closed. He will change his voting residence to agree with the pulling at his heart strings, as it were. Thus, he will become an all-the-year-round citizen rather than a mere summer vacation seeker.

When such a person now seeks a country home, what does he first consider? Trees and woods, by all means; next, and, perhaps, in some instances, first: water for bathing and boating purposes. This latter is not always a prerequisite, and, in any event, is usually to be found near at hand, but the trees and woods are invariably so. Let us look ahead twenty, thirty, forty years, or whatever you please, when all the more desirable places have been selected. In the meantime, some farmer, guided by the advice of the foresters, has planted fifty or one hundred acres of white pine. At the end of twenty years it is not fit for timber, but it certainly is large enough to be attractive to the city man, and, likely, there is a good cover for a shooting preserve. Certainly, pleasant drives and shady avenues can be laid out, so, taking it all in all, a pine growth of twenty years has a commercial value entirely apart from its use as lumber. If the trees have endured to a forty or fifty year growth, they will be still more desirable for the purpose of barter for the city man's money. Thus, is it not a fair argument that he would pay three or four times as much as any possible commercial value attributable thereto if converted into lumber? The very scarcity of such woodland will give it a greatly increased value over any possible use for lumber. Consequently, do not offer the farmer the argument that by planting trees and waiting, say, from thirty to forty years, he may, at the end of the time—if he survives—get back four or five per cent yearly interest, upon his money—that is, he may collect both his principal and interest together. He knows that if he suddenly wants a part of his money, in the meanwhile, it is not as available as in a savings bank. But encourage him with the thought that his land will be quite valuable in a very short time; that he may not have to wait the thirty or forty years if he does not wish; that fifteen or twenty years will produce a desirable growth, and that instead of receiving three or four per cent upon his money, he may get six to ten per cent yearly interest return upon his invested principal, after deducting all expenses of care, taxes, etc.

That is the crux of the whole matter! If you can convince the farmer that his forest land will be more desirable in the early future, for purposes of preservation—many times over what it ever can possibly be to strip for lumber—you have an argument that will be more likely to deserve his serious attention.

FORESTRY AND LUMBER MEETINGS

June 2—Yellow Pine Manufacturers' Association, Hotel Baltimore, Kansas City, Mo. Semi-annual meeting.

June 3, 4—National Lumber Manufacturers' Association, Hotel Baltimore, Kansas City, Mo. Annual meeting.

June 5, 6—National Hardwood Lumber Association, Hotel Sherman, Chicago, Ill. Annual meeting.

June 9, 10—Arkansas Association of Lumber Dealers, Little Rock, Ark. Annual meeting.

July 7-10—Canadian Forestry Association, Winnipeg, Man. Annual meeting.

July 9, 10—Pennsylvania Lumbermen's Association, Atlantic City, N. J. Summer meeting.

July 22, 23—Directors of American Forestry Association, in conjunction with Society for Protection of New Hampshire Forests, The Northeastern Foresters, New Hampshire Timberland Owners' Association, New Hampshire Pine Lumbermen's Association, Massachusetts Forestry Association, and New Hampshire State Forestry Commission, at Lake Sunapee, N. H.

August 19-21—National Commissary Managers' Association, St. Louis, Mo. Annual meeting.

TIMBERLAND TAXATION IN PENNSYLVANIA

PENNSYLVANIA has again justified her claim to stand in the front rank of the States pursuing an advanced and intelligent system of encouragement of forestry. The three taxation bills, prepared by committees of the Pennsylvania Forestry Association and of the Pennsylvania Conservation Association, based on the accepted principle of a light tax on the land and a percentage tax on the yield, passed the legislature finally on May 21.

They conform to the recommendation in the message of the Governor of Pennsylvania to the Legislature under date of January 7 last (at the opening of the legislature), when he said:

"The experience of older countries is that a well-maintained and well-developed forest is a never-failing resource and an asset of increasing value. The preservation of the wild life of the commonwealth—the game, fish, and especially, insectivorous birds—is dependent upon the forests. The denuded mountain is of no value in conserving and maintaining a full stream supply. The health conditions of the State are augmented favorably by the presence of large areas of forest.

"Pennsylvania now owns 982,337 acres of timberland, which is being developed into good forest. I recommend that liberal appropriations be made for the continuance of this valuable work, to the end that increasing areas may be purchased, additional work undertaken, forest nurseries established, and thorough protection of the forests made possible.

"I recommend that you consider the feasibility of devising a plan whereby a reasonable annual tax may be imposed upon timberland, with a deferred tax on the timber, to be assessed and paid when the timber is taken therefrom, in order to prevent the constant cutting of growing timber by private owners who claim they can not afford to conserve it under the present system of taxation."

Dr. Henry Sturgis Drinker, President of the American Forestry Association, and an active member of the Pennsylvania Forestry Association, acted as chairman of the committee on legislation of the latter association in the preparation and presentation to the legislature of these bills, in co-operation with Mr. A. B. Farquhar, of York, Pa., who acted as chairman of the similar committee of the Pennsylvania Conservation Association, of which committee Dr. Drinker was also a member.

After the passage of the bills the following communication was sent to the members of the Senate and House expressive of the feeling of the friends of forestry and conservation for the action taken:

"May 26, 1913.

"TO THE MEMBERS OF THE SENATE AND HOUSE OF REPRESENTATIVES OF THE LEGISLATURE OF PENNSYLVANIA:

"The friends of forestry and of conservation in Pennsylvania profoundly appreciate and value the action of the legislature in passing the three timberland taxation bills, introduced respectively by the Hon. Joseph Alexander in the Senate, and by the Hon. George W. Williams in the House, and desire to express to the members of the Senate and of the House of Representatives their conviction that these wise and just measures will go far to encourage and foster in Pennsylvania the reforestation of our desolated lands and promote a new growth of the timber so needed in the State.

"The Pennsylvania Forestry Assn.
"The Pennsylvania Conservation Assn.
"The American Forestry Assn."

These bills represent the culmination of a constant effort of the friends of forestry in Pennsylvania extending over many years. Similar bills were introduced in the legislatures of 1907, 1909, and 1911, but failed of final passage,

and in these successive efforts all phases of the question have been studied and considered. Finally as a preliminary to the presentation of the bills at the present session the committees in charge communicated with the proper authorities of every State in the Union as to the status of the matter in other States. It was shown that this system of taxation, first broached and advocated in Pennsylvania years ago* by that veteran leader of forestry, Dr. J. T. Rothrock, and urged by him, and by the Hon. S. B. Elliott and the members of the Pennsylvania State Forestry Reservation Commission, had been taken up and adopted in other States and was now being generally advocated. Committees of the Senate and House carefully studied the question and the bills were finally passed by unanimous votes of both Houses.

As these bills were passed just before this magazine went to press it is impossible to print them in full. They will, however, appear fully in the July number, as they are excellent types of the kind of legislation so much desired in other states.

*See paper by Dr. J. T. Rothrock, member of the Pennsylvania Forestry Reservation Commission, read before the American Philosophical Society, March 2, 1894, Proceedings American Philosophical Society, Vol. 33, pages 129-130. Also "Forest Leaves," Vol. 3, p. 153, 1892, article "Remove the Tax from Timberland" by Dr. J. T. Rothrock.

A PRACTICAL OPERATION

By D. F. Shull

IN the past several months I have applied several times to the U. S. Forestry Department for information in regard to timbering and as to rule of measuring, etc., and from the information I have gathered I worked out a method of operation in timbering a 600-acre tract of land located on the Palmace River, Beaufort County, N. C. This tract had been timbered to about 12-inch stumpage thirteen years ago when I purchased the land. No timber has been cut on the land since then.

I am now making an effort to timber the land as a crop. My rules for cutting are as follows: We cut all trees 16 inches and over in diameter. We use up the whole tree up to 8-inch lop butt. We do this as we have been unable to find any market for tops that will pay to work them up. For this reason we work all of the stem of the tree possible so as to leave as small amount of waste as possible on the land and the mills are now willing to buy as small as 7 to 8 inch in diameter. We raft our logs in the creek on the property and deliver the raft at the mouth of the creek at so much per thousand, 2/3 rule measurement.

My man in charge goes ahead of the tree cutters and measures the tree with a 16-inch gauge, and when of a size to be cut he selects the best way to throw the trees so as to do the least injury to the young timber and then places a blaze on the bark with a hatchet. This blaze indicates to the cutters that the trees are to be cut down, as well as indicating in what direction it is to be thrown. We supply the cutters with two steel wedges three inches wide and one inch thick at the butt. These the cutters drive after the saw with a four-pound sledge hammer to throw the tree as indicated by the blaze if it should lean in the opposite direction. This method we have found very efficient and enables the cutters to throw a tree with exactness. The blazing of the tree and the use of the iron wedge has another advantage, if in following up the work of the cutters, and finding trees have broken saplings, it is possible by simply examining the butt of the tree to at once see by the blaze if the cutters had knotched the tree in the proper direction and by examining the stump may at once tell whether they had used the iron wedges. Crooked and defective trees are all cut down to as low as 10-inch stumpage so as to get rid of them.

In measuring up a raft of logs we have adopted a form of blanks bound in book form with a carbon sheet for duplication. I furnish these books to

the mill men and one is used by my man in charge of the timbering. When a raft is complete he sends me a copy filled out, giving number of raft and his measurements and all other details. The mills also make their own reports from their measurements and send me a copy with their check, which gives me two measurements on the raft for comparison. These reports, as you will appreciate, after this tract has been timbered will give me the grand total of the whole operation of the 600 acres; with this information, and having the trees cut to a standard of 16 inches, will, at the next time of timbering, eight or ten years from now, enable me to figure the exact growth of the timber per acre on this tract for each year for the period dating from the present cutting. I offer this information on my operation thinking that you might gather something of value from my experience in this work as far as we have progressed. We are this week constructing our eighth raft, each raft running from 500 to 800 logs, the different rafts averaging from 82 to 92 board feet to the log.

TIMBER SALES IN CALIFORNIA

THE usual number of small sales are reported on the national forests in California. The following contracts have been approved in the district office at San Francisco during the past month:

Sequoia Forest, Hume-
Bennett Lumber Co.--1,544,000 Feet
Sierra Forest, W. A.
Noland ----------3,000,000 Feet
California Forest, C. S.
Benner ---------- 330,720 Feet

The Hume-Bennett sale area adjoins private timber owned by the same company and will be logged in connection with it. The timber is mostly mature and over-mature and its removal will be quite an improvement to the forest. W. A. Noland is engaged in the manufacture of trays which are used in the drying of fruit, especially raisins, and the timber purchased will be cut for this purpose. While a large amount of material is used each year in California in the manufacture of trays, the demand is to a certain extent limited, and Mr. Noland's operations each season will be governed accordingly. Another area of 1,500,000 feet is being advertised on the Stanislaus Forest and bids will be opened June 16.

A logging engineer and lumberman have completed the examinations and reports on a number of sale areas which were cruised last year. These areas vary in size from 50 to 200 million feet each. A number of inquiries are being received in regard to them and several prospective purchasers have made examinations on the ground.

A crew of eight men began reconnaissance on the California National Forest May 15. A similar crew will be started on the Sierra Forest June 15, and one crew each on the Klamath, Plumas and Tahoe Forests July 1. They will remain in the field until some time in October. In each crew of eight men there will be at least two who have had special training and experience in this work. The remainder of the crews will consist of Forest School students, usually men with at least one summer's experience.

WOOD-USING INDUSTRIES OF VIRGINIA

A VALUABLE booklet on "The Wood-Using Industries of Virginia," compiled by Roger E. Simmons, statistician of Forest Products, of the Forest Service, and arranged in co-operation with Commissioner of Agriculture Koiner, of Virginia, and printed under the direction of the American Forestry Association, has just been issued. It is profusely illustrated and contains a great deal that is of interest and value not only to the many Virginia manufacturers who use wood, but to all who are interested in the wood industries of the State.

FOREST AND LUMBERING INVESTIGATIONS

Organization of the Sub-Committees Representing the Forestry Committee of the National Conservation Congress.

REALIZING the great need of constructive work in matters of forest conservation the foresters and lumbermen in attendance at the Fourth National Conservation Congress in Indianapolis last year held several informal meetings out of which grew a new plan for awakening public sentiment, and for collecting, compiling and disseminating reliable data on forestry and lumbering. President Charles Lathrop Pack promptly offered the endorsement and facilities of the National Conservation Congress and constituted the forestry committee of the Congress a body to direct the work of sub-committees. The standing sub-committees are broadly representative and to them has been delegated the collecting of complete and reliable information on the assigned subjects, and its compilation into reports which will be practical and authoritative to the last degree.

The financial end of the work has been liberally provided for by a special fund donated by the American Forestry Association, and the same association will use its magazine and other facilities in giving publicity to the forestry committee's findings.

The forestry committee of the Congress as appointed by President Pack, consists of Henry S. Graves, chairman, J. B. White, E. T. Allen, W. R. Brown and E. A. Sterling, secretary.

The standing sub-committees are made up of men representing the best knowledge on each subject assigned. Their work has been outlined definitely to avoid repetition of endeavor under the direction of the forestry committee. The sub-committee subjects and members are as follows:

Publicity Committee.

1. Publicity at the meetings of various popular and technical organizations.

2. Publicity of the forestry work of the Conservation Congress, both of the general Congress and of the forestry committee.

3. Publicity through the press, looking particularly to the arousing of public interest in fire protection, taxation and State forestry.

4. Publicity methods and devices useful to fire associations and other forest protective agencies.

Chairman, E. T. Allen, Forester Western Forestry and Conservation Association, Portland, Oregon.

T. B. Wyman, Secretary Northern Forest Protective Association, Munising, Mich.

F. W. Rane, State Forester, Boston, Massachusetts.

P. S. Ridsdale, Secretary American Forestry Association, Washington, D. C.

O. W. Price, Vice President and Treasurer National Conservation Association, Washington, D. C.

Federal Forest Policy Committee.

1. The needs of the Federal Government in matters of forest legislation.

2. National versus State control of national forests.

3. Economics of timber supply in relation to production and consumption.

4. Details of national forest administration.

Chairman, Jos. N. Teal, Chairman Oregon Conservation Commission, Portland, Oregon.

Hon. A. F. Lever, Congressman, Lexington, South Carolina.

Robt. P. Bass, Ex-Governor, New Hampshire, Peterboro, N. H.

E. C. Griggs, Pres. National Wholesale Lumber Manufacturers' Association, Tacoma, Washington.

State Forest Policy Committee.

1. Established principles in framing, passing and enforcing State forest laws.

2. Acquirement and management of State forest reserves, with special reference to cut-over lands.

3. Co-operation between States, between the States and the Federal Government, and between States and private agencies.

4. General report on the status of State forest work.

Chairman, W. T. Cox, State Forester, St. Paul, Minn.

F. A. Elliott, State Forester, Salem, Oregon.

C. R. Pettis, Supt. of State Forests, Albany, N. Y.

H. H. Chapman, Prof. Yale Forest School, New Haven, Conn.

J. E. Rhodes, Secy. Mgr. National Lumber Manufacturers' Association, Chicago, Ill.

Forest Taxation Committee.

1. Existing tax laws and their influence on forest management.

2. Basic principles of wise forest taxation, with definite suggestions for legislation.

3. Forest taxation in other countries.

4. Bibliography for students of forest taxation.

Chairman, Gifford Pinchot, Pres. National Conservation Association, Washington, D. C.

F. R. Fairchild, Prof. Yale University, New Haven, Conn.

Dr. H. S. Drinker, Pres. Lehigh University, South Bethlehem, Pa.

E. T. Allen, Forester, Western Forestry and Conservation Association, Portland, Oregon.

F. M. Griffith, State Forester, Madison, Wisconsin.

Forest Fires Committee.

1. Fire prevention by States, by the Federal Government, and by private interests.

2. Forest fire association work, with special reference to the possibility of co-operation and standard practice between the various protective associations.

3. Forest fire insurance.

Chairman, C. S. Chapman, Secy.-Mgr. Oregon Forest Fire Association, Portland, Oregon.

D. P. Simons, Mgr. Sound Timber Co., Seattle, Washington.

F. H. Billard, Berlin Mills, N. H.

Coert DuBois, Forest Service, San Francisco, California.

J. S. Holmes, State Forester, Chapel Hill, N. C.

Lumbering Committee.

1. The lumber industry; its economic importance, and the principles governing methods, market, and prices.

2. The application of scientific management to lumbering operations.

3. Report on log and lumber measures, with recommendations for standard scales.

4. Forest engineering.

Chairman, R. C. Bryant, Prof. of Lumbering, Yale University, New Haven, Conn.

G. M. Cornwall, Editor "The Timberman," Portland, Oregon.

J. B. White, Lumberman, Kansas City, Mo., Past President National Conservation Congress.

J. F. Clark, Forest Engineer, Vancouver, B. C.

F. A. Silcox, U. S. Forest Service, Missoula, Mont.

Adam Trieschmann Crossett Lumber Co., Crossett, Arkansas.

C. S. Martin, Saginaw Timber Company, Aberdeen, Washington.

W. R. Brown, Lumberman, Berlin, New Hampshire.

Forest Planting Committee.

1. Conditions under which commercial planting is desirable.

2. Nursery methods.

3. Field planting methods.

4. Natural versus artificial regeneration.

Chairman, E. H. Clapp, U. S. Forest Service, Washington, D. C.

T. T. Munger, U. S. Forest Service, Portland, Oregon.

S. N. Spring, Prof. Forestry, Cornell University, Ithaca, N. Y.

S. B. Detwiler, Supt. Chestnut Blight Commission, Philadelphia.

Forest Utilization Committee.

1. Closer utilization in logging.

2. Closer utilization in manufacturing.

3. Closer utilization in marketing.

4. The preservative treatment of timber.

Chairman, R. S. Kellogg, Secretary Northern Hemlock and Hardwood Manufacturers' Association, Wausau, Wisconsin.

H. S. Sackett, Vice President Forest Products Company, New Orleans, La.

E. A. Ziegler, Professor Mt. Alto Forest Academy, Mt. Alto, Pa.

McGarvey Cline, Madison, Wis.

Forest School Education Committee.

1. Forest school education—its strength and weakness.

2. Courses or methods of teaching needed to better fit men for practical work in lumbering.

3. Ranger schools and short courses for woodsmen and farmers and the teaching of forestry in public schools.

4. Function of schools in technical investigations.

Chairman, J. H. Toumey, Director Yale Forest School, New Haven, Conn.

W. Mulford, Director Forest School, Cornell University, Ithaca, N. Y.

C. H. Shattuck, Professor of Forestry, University of Idaho, Moscow, Idaho.

Geo. S. Long, President Washington Forest Fire Association, Tacoma, Washington.

Forest Investigations Committee.

1. Subjects demanding investigation.

3. Responsibility for investigative work; correlation and avoiding duplication.

Chairman, Raphael Zon, U. S. Forest Service, Washington, D. C.

F. B. Laney, U. S. Forest Service, Washington, D. C.

W. Mulford, Director Forest School, Cornell University, Ithaca, N. Y.

C. G. Bates, U. S. Forest Service, Denver, Colo.

Prof. Alex G. McAdie, Weather Bureau Station, San Francisco, Cal.

THE NATIONAL CONSERVATION CONGRESS

"FROM every standpoint," said Charles Lathrop Pack, President of the Fifth National Conservation Congress which is to meet in Washington on November 18, 19 and 20, "the Executive Committee did well in selecting Washington for this year's meeting. In my judgment, Washington as a meeting place offers the Congress greater opportunity for usefulness this year than any of the several other cities which were good enough to extend us invitations. It seems to me that when such men as Gifford Pinchot, J. B. White and Walter H. Page, as well as the other well known members of the committee agree unanimously that Washington is the place for the meeting there is nothing else to be said.

"For many months I have thought it was time for the Conservation Congress to come back to Washington where the conservation movement was born at the Conference of Governors, at the White House, in 1908. In the five years that have since elapsed, conservation has become a great national issue. We have won most of our fights, but there are others that will yet have to be won. For instance, right now, we are facing most determined opposition to the conservation principles of forestry and waterpower for which the White House Conference declared, and for which we have been fighting. This fight is not yet won. Every member of the Conservation Congress can render patriotic service by rallying around the standard which the Conservation Congress has set up. The Conservation Congress, as the clearing house for the State conservation commissions and the conservation committees of the national associations is, at its annual meetings, helping shape principles and policies to be recommended to our legislators in the national Government and in the States.

"Undoubtedly, the live questions of forestry and waterpower will dominate this year's Congress. Already the lines are being drawn for a fight. This is shown by misleading reports which the common enemies of conservation have been scattering to the effect that there might not be harmony between ourselves.

"In Washington, we shall be in close touch with the heads of the Government departments which deal with conservation. Besides, at our meeting, in November, we shall have the benefit of the counsel of the officers of the Conservation Association, and many Senators and Representatives in Congress who will be in Washington at that time.

"Great interest is felt in the coming Washington meeting and although the time is six months away, there are indications of a record attendance. It is not strange that there should be activity by the enemies of the principles which the Conservation Congress has always stood for at its meetings in Seattle, St. Paul, Kansas City, and only last autumn at Indianapolis. Of course, they don't like it and want to make trouble —forestry and waterpower are live subjects and the people can trust them to the deliberations of the National Conservation Congress.

"Forestry matters to be presented at the Washington meeting are in safe and able hands. Henry S. Graves is chairman of the forestry committee. The other members are: E. T. Allen, J. B. White, W. R. Brown, and E. A. Sterling, secretary.

"As to waterpower, the Conservation Congress has always held that the remaining waterpower sites in the hands of the Federal Government should not in any may pass to the use of private interests without safeguarding the treasure now the property of the people. The report of the able committee on waterpower will be awaited with great interest. They are to report at the November meeting in Washington.

"It has been a source of gratification to many of us that President Wilson and the new administration are upholding conservation principles in many different fields. Our forthcoming meeting in Washington can not help but exert a widespread influence in giving direction and energy to the principles and policies for which all of us have been fighting and will have to continue to fight."

NATIONAL LUMBER MANUFACTURERS' ASSOCIATION

THE members of the National Lumber Manufacturers' Association, together with a large number of interested guests, met for the annual session at Kansas City, Mo., on June 3 and 4. There was an unusually large attendance and aside from the general business of the meeting there were a number of addresses of unusual interest.

Capt. J. B. White, of Kansas City, welcomed the members and visitors and Wm. Irvine, of Chippewa Falls, Wis., responded. Then followed the address of the president, Mr. Everett G. Griggs, of Tacoma, Wash., and the report of Secretary J. E. Rhodes, who has been very active during the year in strengthening the organization.

Among the addresses during the meeting were the following:

"The Chamber of Commerce of the United States of America," Harry A. Wheeler, President, Chicago, Ill.

"The Business of Government and the Government of Businesses," Alfred B. Cruikshank, Esq., New York, N. Y.

"A Forest Products Exposition," Edward Hamar, Chassell, Mich., President, Northern Hemlock and Hardwood Manufacturers' Association.

"The Fibre Box Case," W. B. Morgan, Memphis, Tenn., Chairman, Na-

tional Classification Committee of Lumber, Box and allied interests.

"Forestry and Lumbering," W. B. Greeley, Asst. Forester, Washington, D. C., U. S. Forest Service.

"The Conservation Committee," J. B. White, Chairman, Kansas City, Mo.

"Where the Interests of the Manufacturers and Retailers Meet," John R. Morehead, Lexington, Mo.

"What the Lumbermen Should do for Their Own," J. A. Freeman, Pasadena, California.

"Control of the Floods; a National Problem," George H. Maxwell, New Orleans, La.

"What the Yale Forest School is Doing," Prof. R. C. Bryant, New Haven, Conn.

"Workmen's Compensation Legislation," Colonel L. C. Boyle, Kansas City, Missouri.

"Track Scale Hearing,"—Before the Interstate Commerce Commission, Geo. K. Smith, Secretary, Yellow Pine Manufacturers' Association, St. Louis, Missouri.

"Discussion of Utilization of Woods and Mill Waste," H. S. Sackett, New Orleans, La.

As this issue was on the press at the time of the meeting, details of the important business transacted will be given in the July issue.

$250,000 FOR A FORESTRY BUILDING

ON Saturday, May 24, Governor Sulzer, of New York, signed a bill providing an appropriation of $250,000 for erecting a forestry building for the New York State College of Forestry at Syracuse University. This is one of the greatest forward steps in the forestry movement for some time, and was the result of vigorous efforts of Dean Hugh P. Baker and his assistants aided by broad-minded members of the New York legislature. The effort to secure this appropriation was encouraged from the first by Governor Sulzer, who is strongly in favor of proper forest conservation.

The $250,000 fund becomes available at once, and it is expected that ground for the building will be broken early this summer. Tentative plans have been prepared by Prof. E. W. Revels, head of the University's Department of Architecture, and are on file at the State architect's office.

The new home of scientific forestry will probably be ready for occupancy in fall of next year. It will occupy a commanding site on the university campus, just south of the stadium, facing Irving avenue and overlooking the city.

The appropriation bill makes provision for the acquisition of the site on which to erect the building. The university will deed to the State an ample area to be used as the site, together with ground for the approaches. Under the terms of the deed, the land will revert to the university should it ever cease to be occupied for State purposes.

In signing the building measure Governor Sulzer filed a memorandum in which he emphasizes the great value of the work being done by the college and the necessity of adequate facilities for carrying on its rapidly increasing activities. He also refers to the importance of forest conservation and reforestation under proper auspices in this State.

At the same time the Governor announced the appointment of nine trustees, who, with the chairman of the State Conservation Commission, the temporary president of the Senate, the State Commissioner of Education and the Chancellor of the University shall comprise the College Board of Trustees. This is in accordance with the act signed April 19 placing the college at all times under State control.

The appointments are as follows:

Charles Andrews, of Syracuse, a University trustee, for many years chief judge of the Court of Appeals.

John H. Delaney, of the Borough of Brooklyn, who was a member of the

Sulzer Committee of Inquiry and whom the Governor appointed as the State commissioner of efficiency and economy.

John R. Clancy, of Syracuse, manufacturer and Democratic Congressman from the Onondaga-Cortland district, and Vice President of the American Forestry Association.

George W. Driscoll, of Syracuse, lawyer and member of the New York State Fair Commission.

Hendrick S. Holden, of Syracuse, a University trustee and former State Senator, who introduced the original measure establishing the College of Forestry.

Louis Marshall, of New York, formerly of Syracuse, a University trustee and President of the Board of Trustees of the College of Forestry since its establishment. He is a member of the well-known law firm of Guggenheim, Untermeyer and Marshall.

Harold D. Cornwall, of Beaver Falls, long interested in forestry and reforestation projects.

Alexander T. Brown, of Syracuse, a trustee of the University and well known as a manufacturer.

Edward H. O'Hara of Syracuse, editor of "The Herald" and President of the Grade Crossing Commission.

The ex-officio members of the new board are:

George E. Van Kennen, of Ogdensburg, chairman of the State Conservation Commission.

Robert F. Wagner, of New York, temporary president of the Senate.

James R. Day, Chancellor of the University.

The identity of the other member of the board will be known when the Governor appoints a commissioner of education to fill the vacancy caused by the death of Andrew S. Draper.

OPPOSES ABOLISHING CHUGACH FOREST

CHIEF FORESTER GRAVES on May 20 appeared before Senate committee on territories in opposition to the bill to annul the proclamation of President Roosevelt, made in 1907, which created the Chugach National Forest, in Alaska. This bill was introduced by Senator Pittman, of Nevada.

Mr. Graves said in his testimony that he considered it would be ill advised to abolish this reservation, which comprises about 11,000,000 acres and contains practically all of the known natural resources in Alaska which have not already been pre-empted by private interests.

"Chugach reservation contains about 4,000,000 acres of good timber land and about 7,000,000 acres of land that is largely arid and uninhabitable," said Chief Forester Graves. "There are also within the reservation large bodies of coal and other minerals. When the President issued his proclamation creating this reserve we had no means of knowing how extensive the forests were as no surveys had been made.

"The reservation comprises all that territory between the Gulf of Alaska on the South, the Chuagen Mountains on the North, Ook Inlet on the East and a line drawn down the 143d parallel of longitude on the West.

"The timber is not so good as that on the Pacific Coast, but it is composed of spruce and hemlock that will be exceedingly valuable when that part of Alaska is opened up and becomes settled. In my judgment it will be a fatal error to throw open the reservation and permit settlers to go in there and despoil the forests without any supervision over cutting. I am in favor of allowing the railroads to use the timber and to cut it under Government supervision so that there will be no waste, but it is not necessary to abolish the entire reservation in order to do this. An amendment of the forest act could be passed which would have the same effect.

"It was suggested to me that I should release certain portions of the reservation, where it is known that there is no

timber, but, having in mind the Controller Bay episode where 12,000 acres of land were released and the controversy that was stirred up thereby, I do not believe it is advisable at this time to make any more releases.

"Plans for the development of this country are on foot and the project is being considered to build a Government railroad system, and there is no way of knowing at this time what lands will be required for terminals, docks and other development work. I can conceive that it might easily happen that the very lands I might now release would stir up another Controller Bay controversy."

FOREST SERVICE STATES COEUR D'ALENE POLICY

THE Forest Service has announced the following policy for the sale of green live timber from the Coeur d'Alene National Forest, Idaho, which will be effective for the next five years: The total amount of timber to be cut in any year will not exceed 50,000,000 board feet. Sale contracts will not exceed three years in duration except in unusual circumstances. An annual cut of not to exceed 10,000,000 board feet will be permitted in any one sale.

This policy is in line with the general principles under which the Forest Service is selling timber. All ripe timber is for sale, but its cutting will be so regulated as to provide for a permanent supply uniform in the amount cut annually upon which the local mills can count definitely. From the best data available it is believed that young stands reaching maturity from time to time will permit an annual cut of the amount mentioned above, indefinitely Provision will be made in each contract to secure a satisfactory restocking of the land cut over, but in such a way as to mean but little additional expense to the operator cutting the timber. The second provision is to prevent speculative purchase of timber. The timber on the Coeur d'Alene Forest is for the most part quite accessible and a contract period of three years, or less, will in most cases amply justify a logger in putting in improvements necessary to carry on the work. The limitation of the size of individual sales is to prevent the monopolization of the whole cut of the forest by one or two large concerns.

In accordance with this policy bodies of timber will be advertised from time to time until the maximum limit of 50,000,000 board feet per year is under contract. Before advertisement, all timber will be carefully estimated and appraised by competent men, the minimum prices fixed being based on the cost of logging with a fair profit allowed to the operator.

This announcement of policy is to make clear to all interested how far the Coeur d'Alene National Forest can be counted on each year to furnish a supply of timber to local concerns and other prospective purchasers.

ANNUAL FOREST CONFERENCE IN THE WHITE MOUNTAINS

THE forest conference in New Hampshire advances each year in interest and attendance. It has now become an established meeting of earnest people to discuss a vital topic. With excursions and comfortable quarters, and an attractive program, a profitable good time is to be expected.

The conference is held under the general auspices of the Society for Protection of New Hampshire Forests, with the co-operation of the State Forestry Commission, the American Forestry Association, and several other State and interstate organizations.

The meeting will be held this year at Sunapee, New Hampshire, which is one of the most attractive in the whole mountain region, on July 22 and 23, 1913. Sunapee Lake is located 1,200 feet above the sea. Near by on Sunapee Mountain is a forest reserve, purchased by the property owners around Sunapee Lake, and given to the Society for Protection of New Hampshire Forests, comprising 656 acres. High up on Sunapee Mountain near its summit, more than 2,000 feet in elevation, is Lake Solitude, comprising six acres. All of the fine old timber around it is within the reservation. From the cliffs above this lake, as well as from the summit of Sunapee Mountain, a magnificent view is obtained extending from Mt. Washington at the north down the whole length of New Hampshire to Monadnock at the south; and from Ossipee at the east, into the heart of the Green Mountains at the west. Hardly any view in New England commands a wider or more pleasing prospect. Many high mountains and several bodies of water are seen.

Headquarters will be at the Soo-Nipi-Park Lodge, reached by steamer from the Lake Sunapee Railway Station. This charming place has nearly a thousand acres of pinewood land. The meetings will be held in the Lake Sunapee Yacht Club adjoining. Other hotels around the lake will add to the accommodations, and ample transportation by boat from different points across the lake will be provided. The program is:

TUESDAY, JULY 22ND.

10 A. M. Excursion up Sunapee Mountain. The Society for Protection of New Hampshire Forests has constructed six miles of trail leading by different routes to Lake Solitude and to the summit. Luncheon will be served at the open-air fireplace at the head of Lake Solitude.

4:30 P. M. Tea will be served at the Yacht Club, MRS. DR. NILSEN, presiding. All members of the Forestry Conference and co-operating associations are invited.

8 P. M. First session of the conference, Lake Sunapee Yacht Club, HON. F. W. ROLLINS, presiding.

There will be a short series of informal reports and addresses presented, with lantern pictures, by officers of the State Forestry Commission and the Society for Protection of New Hampshire Forests.

Short addresses will follow from members of the conference, including remarks by DR. B. E. FERNOW, dean of the Forest School, University of Toronto, and Professor FILIBERT ROTH, Director of the Forest School, Ann Arbor, Michigan. Addresses are expected from DR. HENRY S. DRINKER, President of the American Forestry Association, MR. CHARLES LATHROP PACK, President of the National Conservation Congress, and Professor JAMES W. TOUMEY, Director of the Yale Forest School.

Miss Edna Dean Proctor will read an original poem upon the Forests of New Hampshire.

WEDNESDAY, JULY 23RD.

8:30 A. M. Excursions through the Soo-Nipi-Park Forest.

10 A. M. "The Influence of the Forest upon Waterflow." Distinguished speakers from the departments at Washington, and from the Connecticut River Waterways Association, and from several leading manufacturing establishments, in Vermont, Massachusetts and Connecticut, have been invited to take part. The possibility of navigating the Connecticut River to Springfield, and of bringing ocean navigation on the Merrimack to Manchester, N. H., will be discussed.

2 P. M. A meeting under the auspices of the New Hampshire Forestry Commission. Reforestation will be the topic considered by specialists from the lumber companies and by the State Foresters from several States. The opening address will be made by Dr. Fernow, and the topics for discussion are:

"State distribution of forest seedling trees."

"When is reforestation practicable for a Lumber Company?"

"What constitutes ample provision for future needs in a State and in the nation?"

4 P. M. Tea will be served, after which DR. JOHN D. QUACKENBOS will present a paper upon "The History of Lake Sunapee and the Protection of its Forests."

8 P. M. A meeting under the auspices of the American Forestry Association, DR. HENRY S. DRINKER, presiding.

The topics:

"Legislative work in the several States."

"The National Forest in the Southern Appalachian Mountains."

"The National Forest in the White Mountains."

An address is expected from MR. CHARLES LATHROP PACK, President of the National Conservation Association, on "The Meaning of Concervation." Several distinguished guests have been invited to take part.

THURSDAY, JULY 24TH.

9 A. M. Annual meeting of the Society for Protection of New Hampshire Forests, followed by excursions to the New Hampshire State nurseries near Concord, and to one or more of the New Hampshire State Reservations.

An excursion will be arranged to the Lost River for those who desire to take it.

In connection with the conference various meetings of Societies and Forestry Associations will take place.

The conference is held under the auspices of The Society for Protection of New Hampshire Forests, with the co-operation of

The American Forestry Association.

The Northeastern Foresters.

New Hampshire Timberland Owners Association.

New Hampshire Pine Lumbermen's Association.

The Massachusetts Forestry Association.

The New Hampshire State Forestry Commission.

Philip W. Ayres, Forester, 6 Hancock Avenue, Boston, Mass., will furnish any further information about the details which may be desired.

The directors and guests of the American Forestry Association will leave New York City on a special car on Monday evening, July 21.

NEW HAMPSHIRE'S SUCCESSFUL FIGHT

By Philip W. Ayres, *Forester*

A SHORT, but sharp and exciting, campaign for conservation has been successfully waged in New Hampshire. The new Democratic Governor and administration in New Hampshire, having control of both Houses of the State Legislature, have undertaken certain combinations of departments as measures of economy and reform. One of these proposed to abolish the State Forestry Commission, and place its work under a Commissioner of Agriculture, with several deputies, one of whom should take over the work hitherto done by the State Forester. By concerted action on the part of all of the conservation interests of the State, this has been prevented. It has been demonstrated conclusively that the Forestry Commission, as an institution, is too valuable to the State to be lost.

Led by the Society for Protection of New Hampshire Forests, the demonstration had the active co-operation of the Timberland Owners' Association, officers of the New England Box Company, representatives from prominent water-power users on the Connecticut and other rivers, and with prompt and enthusiastic help from the American Forestry Association, the Forest Service, the National Conservation Association, and with letters from the leading forest schools throughout the country and several State Foresters. The Governor, who at first proposed the combination, became convinced that the work as conducted at present on an independent basis, is approved by the people throughout the State, and by his direction the forces that were set to work to abolish the Forest Commission were brought around to support it.

Seldom has New Hampshire expressed itself more promptly and vigorously. Several Ex-Governors, including Frank W. Rollins and Henry B. Quimby, gave their influence. Dr. William J. Tucker, formerly President of Dartmouth College and probably the most respected man in New Hampshire, assisted. Leading lumbermen who could not personally attend the hearing, sent telegrams. At the committee hearing Governor Felker himself appeared, following the precedent of President Wilson, to advocate the combination of the two departments. Many people who wanted to be heard in opposition, continued to put in their testimony until after midnight. The legislative committee of five, which was three to two in favor of the combination, reported next morning unanimously for keeping the Forestry Commission separate and independent. This action has since been ratified by the Senate, and has been accepted by the whole State. The entire contest was conducted without the use of personalities, and consequently no bitter feeling follows.

Some of the circumstances that made this short agitation successful are as follows:

1. The Commission is composed of three of New Hampshire's best citizens, who, for a number of years past, have given devoted service to forest work in New Hampshire, not only without salary, but also paying their own expenses. The expense of the Commission to the State of New Hampshire last year was only $39.25. Furthermore, the Commissioners from time to time have contributed personally to further forestry work in the State. Thus, Mr. Robert E. Faulkner, of Keene, donated his salary as Secretary of the Association for two years. This money, among other uses, started the first fire lookout station on a mountain top in New Hampshire for protection of a wide area from fire. Governor Robert P. Bass and Mr. W. R. Brown, of the Berlin Mills Company, personally contributed the money which started the State nursery, through which now many thousands of

seedling forest trees are distributed annually.

2. The Forestry Commission had shown the broadest spirit of helpful co-operation. By this means it had become not only the distributor of $8,000 for the suppression of forest fires in the mountain region, paid by the U. S. Forest Service under the Weeks Act, but also of a considerable appropriation, which in the course of a year may amount to as much as $4,000, from the U. S. Bureau of Plant Industry, toward checking the advance of the Chestnut bark disease, thus atttempting to preserve a million dollars' worth of chestnut timber in New Hampshire. Furthermore, the New Hampshire Timberland Owners' Association raises $10,000 annually, and expends this in direct co-operation with the State Forester in the suppression of forest fires and other work in the northern part of the State. The Forestry Commission joins the other agencies in the State, the Society for Protection of Forests, and the State College in their efforts at progressive forestry legislation, and in conducting educational forestry work. The Commission has a record, therefore, of valuable accomplishment.

3. In the State Forester, Mr. E. C. Hirst, the State has a man whose knowledge and good sense has been tried during four years. Mr. Hirst was appointed with the approval of the Forest Service, after a training at the Yale Forest School, and in West Virginia, Texas, and on the Pacific coast. Had he not been a devoted and hard-working official during the last four years, it would not have been possible to have prevented the sudden attack upon his department from being successful.

4. There was at hand a well-organized State Association, the Society for Protection of Forests, and a well-organized Timberland Owners' Association. Both came into action without a moment's delay.

Because of this attack, successfully met, the State Forestry Commission in New Hampshire is now in a stronger position than before. Its plans and work are far more widely understood and appreciated.

As Professor Roth said after sending a telegram from Ann Arbor:

"Just such fights as this (and even if you lose out temporarily) make us work for more efficiency, and give us a chance to show the people what is involved in the great struggle. Also it lines up the good people, and shows the *doers* as against the mere *sitters.*"

The Society for Protection of Forests in New Hampshire desires to express at this time and in this manner its cordial thanks to all who helped so generously and promptly, including the President and Directors of the American Forestry Association.

FORESTRY ENGINEERS ORGANIZE COMPANY

THE Northern Engineering & Forestry Co. has been organized at Munising, Mich., by Thomas B. Wyman, Walter W. Gleason and L. E. Adams and will engage in a general engineering and forestry contracting business. Mr. Wyman was for six years forester in the land department of the Cleveland Cliffs Iron Co., and for the last two years has been the active man in the Northern Forest Protective Association, besides head of the forestry school bearing his name. Before coming to Munising as professor of logging engineering, Mr. Gleason was logging superintendent of the A. Sherman Lumber Co. and the Racquette River Paper Co., at Potsdam, N. Y. Mr. Adams came to Munising about four years ago as county road engineer, and was for years chief of the engineering force of the Cleveland Cliffs Iron Co. All three men are recognized as specialists in the work the new concern is organized to carry on.

FIRE PROTECTIVE WORK IN OREGON

A NUMBER of Clatsop County timber owners met in the offices of the Oregon Forest Fire Association in Portland, Ore., a short time ago to discuss the advisability of forming a fire patrol organization to cover that county. The State was represented by F. A. Elliott, State Forester.

Although individual owners have in the past maintained patrols in this county, it was the opinion of many that there would be a decided advantage in a pooling of interests for patrol purposes, and, after thoroughly discussing the advisability of this, by-laws were adopted and the Clatsop County Fire Patrol Association formed.

Officers elected were: J. H. Haak, President, J. H. Walker, Vice-President, and C. S. Chapman, Secretary and Treasurer.

A Board of seven Directors were elected, as follows: H. K. B. Davis, J. H. Haak, S. F. Owen, D. M. Stewart, J. E. Wheeler, J. H. Walker, and Louis Woerner.

It is the intention of the Association, in addition to maintaining strong patrol, to station a man on Saddle Mountain, the highest point in the County, and connect this point by telephone with the line from Astoria to Jewel. From this lookout point it is possible to see a great portion of the county, and it is thought that this will go far towards detecting any fires that may start, enough so, that serious damage will not result.

The Douglas County Fire Patrol Association held its annual meeting in the parlors of the Imperial hotel, Portland, recently.

A number of the timber owners from the southern part of the state were represented as well as those owners residing in Portland. The meeting was well attended. It is the intention of this association to build up a strong organization in the county, and increase the patrol to a considerable degree over that maintained last season. The work necessary to bring this about will be considerably due to the large number of small owners in the county who will have to be reached. It is thought that the recent law compelling patrol of timber lands will cause some of those owners who failed to support the association last year to affiliate, and this will result in the possibility of doing a great deal more work.

The headquarters of this association are in Roseburg, Ore., but the meeting was held in Portland, in order that the large number of owners here might attend.

Officers elected were: H. J. Frear, of Roseburg, President; A. C. Shaw, of Portland, Vice-President, and R. E. Smith, of Roseburg, Secretary and Treasurer.

A Board of Directors, composed of H. J. Frear, C. M. Crego, A. C. Shaw, Frank Gardner, William Brewster, J. W. Alexander, and A. W. Rees, was elected to manage the affairs of the association the coming year.

A meeting of the Clackamas-Marion Counties Fire Patrol Association was held at the offices of J. W. Alexander, in the Lumbermen's building, Portland, Ore. The principal timber owners of the county were present in person or by proxy, and, in addition, the meeting was attended by: E. T. Allen, of the Western Forestry and Conservation Association; F. A. Elliott, State Forester; T. H. Sherrard, Supervisor of the Oregon National Forest.

Secretary C. S. Chapman gave a brief review of the work accomplished the past summer, and pointed out new work that should be undertaken by the Association. State Forester Elliott assured those present of continued hearty co-operation on the part of the State. It was decided to increase the patrol and to complete several pieces of trail which will tie up the whole

system and make it possible for wardens to do much better work than has been possible heretofore.

Officers elected were: J. W. Alexander, President; R. N. Townsend, Vice-President, and C. S. Chapman, Secretary and Manager.

The Board of Directors elected to manage the affairs of the Association the coming year were: J. W. Alexander, E. S. Collins, F. C. Knapp, R. N. Townsend and T. A. Cornwell.

FOREST FIRES OF THIS SPRING

DOUBTLESS the best argument for increased efforts to protect the forests from fires are the fires themselves. There have been many during the last few months. There will be more in coming months. The damage has already been great. Precautions against the fires, organized and intelligent methods of fighting them, and fire patrol work which is yearly increasing in efficiency did, however, prevent many fires from spreading far, and to date no reports of startling destruction have been received. Press dispatches have, however, almost daily chronicled fires in one part of the country or another. A few reports are appended in brief, and these are arguments for urging constant improvement in fire protective measures:

Egg Harbor, N. J., May 11.—Thousands of acres of fine timberland were destroyed in West Egg Harbor today by the fiercest forest fire that ever swept this section. Three houses were destroyed and many people had narrow escapes.

Watertown, N. Y., May 12.—A fire which swept over three square miles of forest south of Star Lake was finally controlled by students and professors of the State forest ranger school at Wanakena. The fire started in the slash made last year.

Albany, N. Y., May 8.—The State Conservation Commission reports that twenty forest fires, which have been devastating the Adirondacks, are now fully under control.

Johnstown, Pa., May 14.—A forest fire ten miles square is sweeping between South Fork and Black Lick Creek. Hundreds of coal miners were ordered from their work to fight the flames.

Olean, N. Y.—Hundreds of acres of second growth timber are being destroyed by fire in Cattaraugus and McKean counties.

Fall River, Mass., May 13.—Ten miles of woodland near here have been swept by forest fires in the last 48 hours. Fred. W. Shepherd was burned to death fighting the flames.

Escanaba, Mich., May 4.—Disastrous forest fires which have been raging for days over Delta County and parts of adjoining counties were checked today by rains.

Shenandoah, Pa., May 11.—Fierce forest fires on Board and Locust mountains south of here are doing much damage.

Warren, Pa., May 14.—Disastrous forest fires are sweeping the woods near here. They reached the edge of Halltown, a lumber town, and the women and children were brought here for safety.

Pittsburgh, May 14.—A serious forest fire in Armstrong County has burned over an area four miles long and a mile wide in the last 24 hours.

North Berwick, Me., May 10.—A forest fire near here threatens to sweep for miles. Help has been summoned from all the surrounding towns.

Battle Creek, Mich., May 12.—Calls for aid to fight a serious forest fire north of Battle Creek were received here today.

These reports cover only a few days and come from only a few States, but a complete list would take pages to reprint and would include nearly every State.

The fires are not as numerous, nor the damage as great as in years past, thanks to effective fire prevention work, but the damage still remains enormous. More money, larger organizations and still more effective fire preventive work is required.

Fred G. Plumber, of the Forest Service, who is gathering statistics of this year's fires, says of the work of the Forestry Service:

"The forest ranger service has reduced the loss through fire by 75 per cent; it has accomplished this within the past few years. The fire loss, however, is still appalling. It amounts to about 30,000,000,000 feet a year. That is an amount equal to the annual growth. That one fact is sufficient to emphasize the seriousness of the situation.

"The forest rangers are about the finest body of young men in the world.

There are 3,600 of them and each is in love with his work. He is willing to undergo any sort of hardship and take any conceivable risk to perform his duties. I know of no service that ranks so high for loyalty and intelligence. Neither do I know of one which gets so great results for the number of men employed.

"The efficiency of this department is being increased constantly, but it alone can not solve the problem. A number of the forest States have rendered material assistance in the enactment of stringent laws for the protection of timber and future legislation will doubtless attain the end desired.

"The worst foe we have to deal with is the forest incendiary. Most of the fire losses are due to the work of men who deliberately set fire to the timber in order to clear the land. Cattlemen have been frequently charged with the responsibility for these crimes."

BOY SCOUTS AS DEPUTY TREE WARDENS

MR. GEO. K. BADGER, president of the Tree Commission of the township of South Orange, N. J., has conceived the idea of calling on the forces of the Boy Scout Company, of South Orange, to aid in the care of the street and highway trees of that place. It is Mr. Badger's intention to have the boys map the town, place correctly the position of every tree, with a report of their condition and a general tabulated classification. The boys' knowledge in woodcraft will stand them in good purpose. They will feel it their duty as "Deputy Tree Wardens" to see to it in the future that there will be no wilful damage done to the trees, and to report the change of conditions by making inspections after storms and taking the matter up with headquarters upon finding any damage done, such as blown branches or other serious injury. They will also take steps to prevent thoughtlessness on the part of school children and negligent drivers who allow their horses to do quite a lot of damage to the unprotected trees on the streets. The Boy Scouts in other towns can take this work up with very good results. Mr. Badger is in hopes that with the care and attention and frequent inspections made by the boys in the troop that the interest in the street shade trees will be taken up by the residents and that there will be thorough co-operation with the boys in their effort to keep the trees in good condition and in a vigorous state. This movement ought to become general as the good derived from the cultivation of this interest in home affairs has a twofold benefit.

FOREST FIRES TO BE REPORTED BY RURAL MAIL CARRIERS

THE official Postal Guide for May calls the attention of postmasters and rural carriers to an order of the Postoffice Department that the carriers report to the proper authorities all forest fires detected along their routes. This order was issued at the request of the Secretary of Agriculture sometime ago and is again being called to the attention of the carriers.

For several years in some sections of the country a sort of informal understanding has existed between National Forest Rangers and mail carriers with the idea of securing increased fire protection. The marked effectiveness of this co-operation was a strong argument in favor of its extension and official sanction, and was in part respon-

sible for the request of the Secretary of Agriculture which resulted in the order by the Postoffice Department.

The plan is for the carrier to report a fire to the nearest forest officer on his route, or, if no officer lives on the route, to have him notified by some responsible citizen. State and National Foresters are supplied with post road maps and with postal guides containing the addresses of the different postmasters. The postmasters in turn are supplied by the foresters with the names, addresses, and telephone call numbers of forest officers residing on or near the carriers' routes.

Co-operation between rural carriers and Federal forest officers will take place in Florida, Arkansas, South Dakota, Wyoming, Colorado, New Mexico, Arizona, Utah, Montana, Idaho, Washington, Oregon, and California. Co-operation with State officers is given in all the New England States, and in New York, New Jersey, Pennsylvania, Maryland, West Virginia, Tennessee, Kentucky, Michigan, Wisconsin, Minnesota, Idaho, Washington, Oregon, and California, all these States having established fire protective systems.

THE CANADIAN FORESTRY CONVENTION

ARRANGEMENTS are now rapidly approaching completion for the Forestry Convention to be held under the auspices of the Canadian Forestry Association in Winnipeg, Manitoba, from July 7 to 9, inclusive. Winnipeg is to Canada what St. Louis and Chicago combined are to the United States. It is the third city in size in Canada and has grown very rapidly in the past ten years. It has now a population of over two hundred thousand and is the gateway through which everything passes from the Canadian East to the Canadian West. The big forest of western Ontario reaches up to within a hundred miles or so of Winnipeg and the city itself is situated on the Red River which may be said to be the eastern boundary of Canada's fertile prairie area stretching to the Rocky Mountains. At the Convention therefore there will be discussions on the handling of the forests in both eastern Canada and the Pacific slope, and also the problems that relate to the prairie country, and the forest reserves on the same. The date has been carefully selected both to secure the attendance of the progressive farmers who have successfully planted 25,000,000 seedlings sent out by the Dominion Government and also to allow visitors from the East and South to see the country just at the beginning of harvest. The Winnipeg Exhibition, one of the greatest permanent fairs on the continent, opens on the closing day of the Convention so that a stranger will be able to get a better idea of the country in three days than he would in a month at another period. The Dominion and Provincial Governments of Canada will be fully represented. A number of delegates have already promised to attend from the United States. Particulars as to special railway rates, etc., can be had from James Lawler, Secretary, Canadian Forestry Association, Canadian Building, Ottawa, Canada.

GIFFORD PINCHOT'S OPINION

(Prof. J. Warren Smith, chief of the Weather Bureau at Columbus, Ohio, concludes that despite the deforestation of the valley of the Ohio and adjacent country, there has really been a decrease in flood days with the same amount of rainfall as compared with the years when the land was forested.

One of the best answers to such a theory is that of Mr. Pinchot, given herewith.—EDITOR.)

WE know in advance that the flood damage of the next ten years, unless something real and effective is done about it, will amount to a needless waste of many hundreds of millions of dollars, just as we know in advance that hundreds of thousands of people will die needlessly of preventable disease in the same time. We are trying to stop disease, but we let the floods alone.

One of the reasons why floods will continue to do more and more harm is because the deforestation of the country will permit them to rise higher and higher. Another and often a very important reason is that the drainage of farm lands lets the water quickly into the streams. Another is because many river channels are being narrowed and encroached upon especially in the cities by buildings, dumps, levees, railroad embankments, etc., and so are less able to carry off the floods. Still another is because the number of farms and the amount of property in the lowlands near the rivers and the railroads grows greater year by year.

Just as it is the last straw that breaks the camel's back, so it is the last foot or two on the crest of a great flood that is responsible for most of the damage. It is altogether probable that reforestation and water storage together at their best could not have prevented all damage from the tremendous downpour of rain in Ohio. But it could and would have prevented the crest of the flood from reaching so great a height, and therefore would unquestionably have relieved us from some of the suffering and loss.

Do forests really influence stream flow? They do. The measurements of the Forest Service and the U. S. Geological Survey in this country, confirming the results of observers abroad, have settled that question for good and for all. It would be mere waste of time to discuss it any longer.

The cost of an effective system of water storage in forests and behind dams will be very large, but nothing like so large as the damage it will prevent. Furthermore, the forests will pay for themselves by their growth, and the waterpower developed by storage will in the end more than meet the cost of storage. Whether we act with intelligence or stupidly sit and wait for the next calamity, it is certain that floods will cost us money. Our choice is whether that cost shall be the dead loss of flood destruction, or the wise and paying investment of forests and waterpowers.

There is only one way to control a river, and that is to control the whole of it. Floods on the lower Mississippi, for example, do not originate in the neighborhoods, or in the States, where they do their harm, but hundreds, or even thousands, of miles away. Reforestation of the headwaters, combined with storage, and combined also with the control of the navigable channels lower down, are the necessary means of defense.

Is this plan practicable? Entirely apart from the report of the Inland Waterways Commission, which asserts that it is; and of the U. S. Geological Survey, which asserts that it is, we have the actual experience of other countries to prove that it is, For example, great reservoirs at the head of the Volga and other rivers in Russia, which store about 35 billion cubic feet of water,

have not only been successful in improving navigation, but have prevented the floods which for many years were a scourge to the lowlands of this part of Russia. In our own country, a partial demonstration of the effectiveness of resevoirs for river control has been made with success on the headwater of the Mississippi River, according to a report of an eminent body of army engineers.

How can the work be done? It is evident that this question can not be handled for itself by any single State. Just as an owner of an upland farm can not be expected to protect the bottom land farm below him from damage by the water which falls on his sloping fields, so West Virginia, Ohio, Minnesota, and Nebraska can not be held responsible for preventing the floods which destroy the plantations of Mississippi and Louisiana. This is a National question, and must be handled by the Nation or not at all. Flood control and States rights can not agree. Neither can we permit State control of the water power developed by the Nation, or under the National authority, in the course of storing tthe surplus waters. The river question is a national question, and to treat it in any other way is to play with it.

The answer to this vast problem of flood control lies in making a general plan for the development and use of our streams, and then carrying it out. The haphazard, piece-meal, pork-barrell methods of the past are largely responsible for our present helplessness against the scourge of floods. So long as we continue to handle this vast National problem by the narrow local methods of small politics over work will continue to be as useless as the levees along the lower Mississippi were last year against the floods which originated in the upper basins of the river, under other State jurisdictions, hundreds or thousands of miles away.

GAS CONTAINED IN CAVITIES OF TREES

By J. A. Ferguson

AN interesting phenomenon connected with the cutting of many of the hardwood trees in the Ozarks is the escape of gas from cavities near the base of the trees. This is a common experience with the oak tie cutters of that region. Other trees, however, have been found similarly affected. When these cavities are cut into the gas escapes with a whistling sound, showing it to be under pressure, and if lighted it will burn with a faint yellow flame. The cavities containing the gas vary in size and shape, but all are alike in that the sides are darkened and look as though seared with a hot iron.

The natives believe that the trees containing the gas have some connection through their roots with an underground supply of natural gas, and are wont to hold on to such lands thinking they may be of value in the future. Prof. F. W. Bushong, of the University of Kansas, made an examination of the gas collected from a cottonwood tree and found it to be substantially the same as natural gas with some free hydrogen. It has been noted that the trees affected in this way, especially the smaller ones, have swollen bases as though they had at one time been injured by fire and the wounds had subsequently healed over. A sample of the side of a cavity cut into by the writer, and from which the gas escaped, was sent to the U. S. Forest Service for examination and was found to show no evidence of having been burned. Neither was there any evidence of fungus attack. Undoubtedly the gas is the product of a decomposition of the heart wood of the trees. It offers an interesting field for investigation.

WIDESPREAD FOREST FIRE WARNING

TO stimulate public sentiment against forest destruction and at the same time promote sanitation, the State authorities of Idaho, Washington and Oregon have endorsed a unique project of the Western Forestry and Conservation Association to supply 300,000 public school children with a folding cup puzzle which shows a way to avoid public drinking cups and also teaches many lessons about the forest fire evil. A square piece of paper, printed on both sides with a jumble of broken text and portions of pictures in bright colors, when folded on dotted lines presents, in a series of four consecutive completed pictures, the growth of a forest fire from carelessness with a match to a final scene of destruction. At the same time are developed a series of rules and precautions, while one side of the completed cup suggests learning to fold it out of any paper anywhere. These will soon be distributed in immense quantities through the public schools.

A 700,000,000 FEET SALE

THE Forest Service is planning to advertise 700,000,000 feet of timber on the Yaak River in the Kootenai National Forest in Northwestern Montana. This timber is located on an area of about 200,000 acres on the West side of the Yaak River. The dominant species is spruce, with larch and lodgepole pine second and third in importance. It is typically a pulpwood chance and will undoubtedly be purchased for that purpose. Twenty years will be allowed for removal and it is believed that the younger stands on the same watershed will make available a perpetual supply for a pulp mill of the size necessary to handle the chance.

100,000,000 FEET OF TIMBER SOLD

A SALE of 100,000,000 feet of timber has been awarded to the Somers Lumber Company, of Somers, Montana. This timber is about 50 per cent Western larch, 25 per cent Douglas fir, and the remainder Engelmann spruce, Western white pine and red ceder. It stands on an area of about 9,000 acres located in a basin along the East side and at the head of Swan Lake in Northwestern Montana. The land is practically all of great agricultural value and as soon as the timber is removed, it will be listed for settlement. The proposed contract provides that all the timber shall be removed on or before May 1, 1918.

ESTIMATING WHITE PINE TIMBER

THE Forest Service reconnaissance crew is engaged in estimating what is probably the largest remaining solid body of Government-owned Western white pine. This is located in the Southwest corner of the Clearwater Forest, Idaho. The area involved is approximately 80,000 acres and tentative estimates place the amount of timber at 1,000,000,000 feet, of which nearly 50 per cent is white pine. The reconnaissance crew is expected to complete its work by the middle of the summer and advertisement is planned for as early a subsequent date as possible.

STATE NEWS

Kansas

State Forester Charles A. Scott, of Kansas, writes:

"We have just had an exceedingly busy season in the State Nursery. Practically everything that we have of suitable size for planting was taken, and we were unable to fill many orders for evergreen planting stock, the demand being greatest for red cedars. The successful growth resulting from the planting of this species last year, and its well-known hardiness throughout the State, has created a heavy demand for it.

"The results of last year's planting of the two-year-old, once transplanted red cedars sold from the State Nursery, from reports secured in October and November, is as follows:

"Seventy per cent of all the trees sold were reported in a living, thrifty condition.

"Forty-two per cent of our customers reported 90 per cent or more of the cedars they planted, in a thrifty, growing condition.

"Fifteen individual planters reported 100 per cent of their cedars in a thrifty, growing condition.

"The season of 1912 was not a favorable one for newly planted trees, but we feel that the above record is a good one, and only indicates what can be done under favorable conditions.

"The State legislature during its past session did not do anything affecting the forestry work in this State, by either adding to our appropriation or diminishing the same, so we will follow along the same lines and about the same rate as we have the last three years, making the State Forestry Nursery the prominent forestry work in this State."

New York

The appropriations for carrying on forestry work in the State of New York for the coming year are as yet indefinite. At the present time $25,000 has been appropriated by the special bill for fire protection. Beyond this $50,000 is in the appropriation bill and $25,000 in the supply bill, making a total of $100,000 for fire protection, although the last two bills had not on May 13 been signed by the Governor. The organization of the fire-fighting force was rather late this spring because of the lack of funds, but the $25,000 carried in the special bill has enabled the commission to man most of the observation stations and put on a large force of rangers. Thus far this spring the fires have been rather severe on the Northern slopes of the Adirondacks, one fire burning up about 25 acres of a red pine plantation. At the present time conditions are well in hand and under average conditions no further trouble is expected.

In the regular bill only $10,000 was allowed for reforesting, surveying and all general forestry work. There has been, however, a special bill put through both houses of the legislature carrying $40,000 for reforesting purposes alone. This bill has not as yet been signed by the Governor, but if this money is available it will probably mean the establishment of at least one more State nursery.

The State has done no reforesting of State lands this spring and the entire available planting stock from the various nurseries has been disposed of to provide individuals, water companies and lumber companies and even then the demand could not be met. The desire seems to be for four-year stock and inasmuch as the calls for stock from the State nurseries are increasing at such a tremendous rate, it is impossible to get sufficient appropriations four years in advance in order that the demands may be met.

Under the direction of the Superintendent of Forests of the Conservation Commission the watersheds of the water supply of the following cities are being reforested. In the case of most of these cities, it means the establishmnt of municipal forests: New York City, Elmira, Port Jervis, Manlius, Ossining, Ogdensburg, Gloversville, Hudson Falls, Ilion, Rochester, Waterville, Glens Falls, Johnstown, Sidney, Lowville, Carthage, Salamanca, Oneonta, Norwich and Troy.

Aside from the $150,000 carried in the above-mentioned bills for fire-fighting and reforesting, the only other appropriations are those carrying the salaries of the employes of the commission and $10,000 for the surveying of State lands.

A bill to reorganize the Conservation Commision making it a single-headed commission rather than with three commissioners did not come up for passage in the last legislature, although the Governor sent a special message to the legislature in this regard.

A bill awaiting the Governor's signature and carrying nearly $300,000 passed both houses of the legislature for the development of hydro-electric power from the surplus waters of the barge canal at two points near the capitol district of the State. This bill is to determine the feasibility of the State development of hydro-electric power and should this prove successful this work will be gone into on a very large scale.

North Carolina

The fall fire season of 1912 closed with a series of the most destructive fires yet re-

ported from Western North Carolina. The estimated damage from many of the counties in that region last year exceeded the total taxes for the year. The total estimated loss, recently compiled from reports covering less than one-half the townships, amounted to $650,000, only a little less than the whole amount of the taxes for the mountain counties. The total damage from forest fires over the whole State amounted to $1,000,000, or more than twice the average annual loss from this source for the past three years.

In spite of this warning the destruction still goes on. The beginning of May was marked by disastrous forest fires in many parts of the State. The daily papers contain such reports as the following:

"Millions of dollars of losses have resulted from the numerous extensive forest fires that have been raging in Western North Carolina mountains the past three weeks. The oldest residents say that no such extensive forest burning has occurred before for more than twenty years. All of Linville Mountain, within two miles of Linville Falls, has been burned."

"Nearly a thousand acres of woodland, including some valuable timber, were swept by disastrous forest fires which raged for more than twenty-four hours in the section surrounding the State School for the Feeble-Minded, two miles West of here (Kinston). The fire is now under control. The damage will amount to several thousand dollars. Twice buildings at the State Institution were saved only by the strenuous efforts of a force of men which worked all night."

"Forest fires, which have been raging for many days on both sides of Dismal Swamp, broke from their confines yesterday despite frantic efforts of volunteer fighters, and are now menacing many villages and cities in Virginia and North Carolina. Hundreds of families have been driven from their homes. The smoke is so dense that the sun is practically obscured for a radius of fifty miles. The John L. Roper Lumber Company and the Richmond Cedar Works estimate their losses in timber at over $100,000."

We have "frantic efforts" to extinguish the fires when they become uncontrollable, but, unfortunately, we do not yet grasp the great primary principles of fire protection expressed in the old proverb "An ounce of prevention is worth a pound of cure."

Two of the North Carolina delegates to the International Institute of Agriculture, meeting in Rome, have signified their intention of also attending the International Forestry Congress which meets in Paris in June. These are Mr. John Sprunt Hill, of Durham, and Mr. A. E. Tate, a large furniture manufacturer of High Point. Mr. Tate has been a prominent member of the North Carolina Forestry Association since its organization, and made an address on "Furniture Manufacturing and the Timber Supply" at the last annual convention of that association.

California

At a meeting held in Los Angeles on April 22 of representative Eucalyptus growers, dealers and manufacturers, there were fifteen present, including representatives from different parts of the United States, who happened to be in Southern California.

At this meeting the "Eucalyptus Hardwood Association of California" was organized, and the following directors were chosen:

F. S. Churchill, President of the Los Berros Forest Company, owning groves in San Luis Obispo County; C. F. Cook, associated with the Eucalyptus Culture Company, owning groves near Escondido; L. M. Pratt, President of the Pratt Eucalyptus Investment Company, owning groves in Escondido Valley and Menifee Valley; Harold H. Stevens, property manager of the California Farm and Home Builders, owning groves in San Luis Obispo County, and C. H. McWilliams, of McWilliams Bros., owning groves in San Luis Obispo County.

The directors met a little later and elected the following officers:

L. M. Pratt, president; F. S. Churchill, 1st vice president; C. F. Cook, 2d vice president; C. H. McWilliams, secretary, and Theo. B. Comstock, treasurer.

The object of the association, as stated in the Constitution, is "to foster and encourage the growing of Eucalyptus timber; to stimulate the manufacture and use of Eucalyptus products and by-products; to furnish authentic information regarding Eucalyptus, and to protect both its members and the public from dishonest dealers in Eucalyptus investments."

As to membership, the Constitution provides that "any reputable person, firm or corporation owning land planted, or about to be planted in Eucalyptus trees, or owning an interest in same, or engaged in manufacturing Eucalyptus products or by-products; or engaged in buying, selling or planting Eucalyptus plantations within the State of California or other parts of North America, or who may otherwise be eligible by the determination of the Board of Directors of this Association, shall be eligible for active membership."

Massachusetts

The Conference on State Forests which was held at Springfield, May 16, was the first organized effort toward procuring State Forests in Massachusetts. Hon. Jas. S. Whipple, formerly Forests, Fish and Game Commissioner in New York, delivered the principal address. Much enthusiasm was shown in the meeting and the following resolutions were unanimously adopted:

Whereas, the State of Massachusetts contains large areas of wild and waste land, which are of little value for farm crops and

which are suited only for timber growing and,

Whereas, private enterprise is unable to reclaim this land and protect it from fire and erosion, or to develop it for the commercial production of timber, and

Whereas, the proper administration of these lands will protect the watersheds and conserve the water supply, will be a means of education along forestry lines, and a commercial asset to the State.

Be it Resolved, That it is the sense of this meeting that these lands should be taken over by the State and developed as State forests, and that the legislature be asked to take immediate action in this direction.

The legislature will undoubtedly be asked to consider the taking over of waste lands as State forests at its next session. The Mount Holyoke Range, which is located along the Connecticut River will be an ideal beginning in this work. It lies very near to four cities and many large towns in the Connecticut Valley and will serve not only as a profitable asset to the State but as a wild park to those communities. Part of it is already covered with timber, but much of it is waste land which should be developed.

Michigan

The bills introduced by the Michigan Forestry Association, and which would have created a State Forester who would have had full charge of the State lands and Forest Reserves and the execution of the fire laws; and which would have enacted a definite policy for the conduct of State lands, and a fire law with teeth in it, were given no consideration by the Legislature. It is understood that the committees held no hearings on these bills, although they had been considered and approved by most of the prominent foresters in North America.

In place of the bills advocated by the Forestry Association, the committees reported out a bill drawn by the Public Domain Commission, which has had charge of the State lands and Forest Reserve, but which has made no effort to assume charge of the fire situation. This bill was finally passed by both House and Senate. The bill refrains from laying down any definite policy for the conduct of the State lands and reserves and contains no word concerning forest fires or any organization to prevent or control them. The one good feature of the bill is that which gives the Commission power to exchange State lands with the Government. This will allow the Michigan and Marquette National Forests to consolidate their holdings, reduce the cost of administration and generally improve the unsatisfactory conditions prevailing in the past on account of their broken condition.

The Public Domain Commission bill which was passed carried an appropriation of $60,000. It is greatly hoped that the Commission will now succeed in at least making some show of results in the State.

The Forestry Association will try for a complete and competent law at the next session of the legislature, introducing the bill which was given no consideration at the last session.

The Association has compiled and published statements from the Michigan Delegation to Congress as to their position in the matter of "States Rights" and the control of the national resources.

Practically all of the Delegation are on record as being opposed to the proposed transfer of the National Forests, etc., to the different States.

The Forestry School of the University of Michigan has recently been called upon to make maps, cruises and plans for handling some of the larger woodlots in the south part of the State. This work is being completed as rapidly as possible and the demand for it indicates a rapidly growing appreciation on the part of owners or the need of careful handling of their woodlots. Such work should properly be handled by the State Forester but, pending the time when the State will have a competent Forester, the University is doing all it can.

The demand for competent foresters has almost exhausted the available men in the Forestry School. One railroad company is taking about thirty of the graduates and advanced students for the summer and many of the positions will be permanent. The demand is greater than ever before and the School has been unable to supply many of the calls made upon it.

Pennsylvania

Forest Inspector George H. Wirt, of Pennsylvania, writes that the planting season in Pennsylvania is about over and that upon the State there have been planted this spring almost four million seedlings. Forest fires have been raging all over the State this last month. They began with the first day of fishing season, and of late have been on the increase. The most common expression with reference to the numerous fires is that they have been set in revenge for the enactment of certain game laws which seem to be repugnant to the people of the forest districts.

Maine

Of interest as related to the movement in regard to scientific forestry in this section of the country is the statement that F. J. D. Barnjum, the mammoth lumber operator of Boston, Mass., and Franklin County, Me., will set out some 10,000 small white pine trees on farm lands in the vicinity of East Madrid, which land is owned by him. The planting will be under the supervision of the Pejepscot Paper Company's forestry expert.

New Jersey

A news item last week told of the launching of what is probably the last raft to go down the Delaware River. It was naively said that not only had the woods disappeared, so there were no more logs to raft, but the river had become more turbulent and dangerous to rafts, while the water was often low. The connection of the two evidently did not occur to the reporter. The upper Delaware watershed has been denuded of its forests by the lumbermen and the stream there is now a torrent at one time and a feeble brook at another, as a consequence. Whether forests influence the rainfall may be questioned, but that the wooded slopes, with beds of leaves which hold the water like a reservoir and feed the springs, check floods and keep up the average of the dry-weather flow, admits of no question. The destruction has been a cruel process for careless greed. Unfortunately, there is no proper atention given to the new growth of trees, which will ultimately restore the river to normal conditions, but which will never give us back the forests of old.

Kentucky

State Forester J. E. Barton, of Kentucky, and J. G. Peters, of the Forest Service, have agreed upon a system of forest patrols and a plan for fire prevention. The State is to be divided into ten districts. Districts eight, nine and ten, embracing the mountain section of Eastern Kentucky and the watersheds of the larger strams, will be patrolled during the latter part of September, all of October and November and the first half of December by thirty men at an approximate expense of $5,400, half of which will be paid by the Government and half by the State.

One patrolman in each county in the mountains is the plan, half of them to be appointed guards in the Federal Forest Service, to serve as State Fire Wardens without pay, and the other half to be State Fire Wardens. In other sections where the danger is not so great, two or more counties will be looked after by one fire warden and in districts four and seven, embracing Jefferson County and the Bluegrass, no warden will be appointed at present.

In his recommendation to the State Board of Forestry Mr. Barton suggests the organization by private landowners in the mountains of fire protection associations, to cooperate with the State and Federal Governments.

CURRENT LITERATURE

MONTHLY LIST FOR MAY, 1913.

(Books and periodicals indexed in the Library of the United States Forest Service.)

Forestry as a Whole

Drinker, Henry Sturgis. The spread of the forestry movement. 16 p. Wash., D. C., American forestry, 1913.

United States—Dept. of agriculture—Forest service. Review of Forest service investigations, vol. 2. 92 p. pl. Wash., D. C., 1913.

Proceedings and reports of associations, forest officers, etc.

British Columbia—Dept. of lands. Report for 1912. 360 p. il., pl., maps. Victoria, B. C., 1913.

Great Britain—Board of agriculture and fisheries—Advisory committee on forestry. Committee appointed by the Board of agriculture and fisheries to advise on matters relating to the development of forestry; reports, July to October, 1912. 63 p. London, 1913.

Harvard forestry club. Bulletin, vol. 1. 45 p. il. Cambridge, Mass., 1911.

Hawaii—Board of agriculture and forestry. Report of the Division of forestry for the biennial period ending December 31st, 1912. 51 p. pl. Honolulu, 1913.

India—Jammu and Kashmir—Forest dept. Progress report of forest administration for 1911-12. 74 p. Lahore, 1912.

Yearbooks and calendars

Annuaire des eaux et forêts pour, 1913. 373 p. Paris, L. Laveur, 1913.

Forest Aesthetics

Street and park trees

Pittsburgh, Pa.—Shade tree commission. Third annual report, 1912. 35 p. il. Pittsburgh, 1913.

Forest Education

New Jersey—Dept. of public instruction. Elementary agriculture leaflet no. 9; trees and forests. 15 p. il., pl. Trenton, N. J., 1913.

Forest schools

Harvard university—School of forestry. Prospectus, 1913-14. 32 p. il. Cambridge, Mass., 1913.

Arbor-day

Pennsylvania—Dept. of public instruction. Pennsylvania arbor-day manual, 1913. 182 p. il., pl. Harrisburg, 1913.

Forest Legislation

New York—Conservation commission. Special report on the efficiency of the top-lopping law. 12 p. pl. Albany, 1913.

Forest Description

Harper, Roland M. The forest regions of Alabama. 4 p. Nashville, Tenn., Southern lumberman, 1913.

Forest Botany

Trees, classification and description

Britton, N. L., and Rose, J. N. Studies in Cactaceae, pt. 1. 3 p. pl. Wash., D. C., 1913. (Smithsonian institution—United States national museum. Contributions from U. S. national herbarium, v. 16, pt. 7.)

Clinton-Baker, H. Illustrations of conifers, vol. 3. 89 p. pl. Hertford, Eng., Simson & Co., 1913.

Deutsche dendrologische gesellschaft. Mitteilungen, no. 21, 1912. 478 p. il. Bonn-poppelsdorf, 1912.

United States—Dept. of agriculture—Forest service. Forest atlas; geographic distribution of North American trees. pt. 1—Pines, by G. B. Sudworth. 36 maps. Wash., D. C., 1913.

Woods, classification and structure

Brown, H. P. Pith-ray flecks in wood. 15 p. pl. Wash., D. C., 1913. (U. S.—Dept. of agriculture—Forest service. Circular 215.)

Silvics

Ecology

Cooper, William S. The climax forest of Isle Royale, Lake Superior, and its development. 115 p. il., map. Chicago, Botanical gazette, 1913.

Rübel, E. Die pflanzengesellschaften des Berninagebietes. 9 p. pl. Leipzig, W. Engelmann, 1913.

Studies of species

Hawes, Austin F. Hemlock in Vermont; comparative study of log rules. 32 p. pl. Burlington, 1912. (Vermont—Agricultural experiment station. Bulletin 161.)

Janka, Gabriel. Untersuchungen über die elastizität und festigkeit der österreichischen bauhölzer; pt. 4: Lärche. 116 p. pl. Wien, 1913. (Mitteilungen aus dem forstlichen versuchswesen Österreichs, heft 37.)

Tubeuf, Carl von. Vegetationsbilder; 1: Pinus montana. 40 p. il. Stuttgart, E. Ulmer, 1913.

Forest Protection

Insects

Weiss, Harry B. and Patterson, Raymond S. Nursery insects. 29 p. il. New Brunswick, N. J., 1912. (New Jersey—Agricultural experiment station. Circular 15.)

Diseases

Mowry, Jesse B. The chestnut bark disease. 4 p. il. Chepachet, R. I., 1912. (Rhode Island—Commissioner of forestry. Leaflet no. 6.)

Fire

Mowry, Jesse B. Damage by fire. 3 p. Providence, R. I., 1911. (Rhode Island—Commissioner of forestry. Leaflet no. 4.)

Mowry, Jesse B. Protection from fire. 8 p. Providence, R. I., 1911. (Rhode Island—Commissioner of forestry. Leaflet no. 5.)

Society for the protection of New Hampshire forests. The railroads and forestry; forest fires; papers and discussion at a forest conference in the White Mts., July 12, 1912. 46 p. Concord, N. H., 1913.

Forest Management

Chapman, Herman H., and Bryant, Ralph C. Prolonging the cut of southern pine. 32 p. il., pl. New Haven, Conn., 1913. (Yale forest school. Bulletin no. 2.)

Forest Economics

Taxation and tariff

Society for the protection of New Hampshire forests. Taxation of forests; papers and discussion at a forest conference in the White Mts., July 12, 1912. 80 p. Concord, N. H., 1913.

Forest Utilization

Lumber industry

Smith, C. A., lumber company. A history, a characterization and a glimpse into the future; the C. A. Smith interests. 100 p. il. Chicago, Ill., The American lumberman, 1911.

Wood-using industries

Surface, Henry E. Bibliography of the pulp and paper industries. 48 p. Wash., D. C., 1913. (U. S.—Dept. of agriculture—Forest service. Bulletin 123.)

Wood technology

Burdon, E. Russell, and Long, A. P. First quarterly progress report on timber research work. 11 p. Cambridge, Eng., 1913.

Pearson, R. S. A further note on the relative strength of natural and plantation-grown teak in Burma. 21 p. Calcutta, 1913. (India—Forest dept. Forest bulletin no. 14.)

Pearson, R. S. Note on the technical properties of timber with special reference to Cedrela toona wood while seasoning. 5 p. pl. Calcutta, 1913. (India—Forest dept. Forest bulletin no. 15.)

Wood preservation

Goltra, W. F. Some facts about treating railroad ties. pt. 1-3. front., tables. Cleveland, O., 1912-13.

Oakleaf, Howard B. Kiln drying Douglas fir and other northwestern woods. 15 p. tables. Seattle, Wash., 1913.

Pearson, R. S. Note on ligno protector as a possible means of preventing timber from splitting while seasoning. 10 p. pl. Calcutta, 1913. (India—Forest dept. Forest bulletin no. 13.)

Auxiliary Subjects

Birds

Zimmer, John T. Birds of the Thomas county forest reserve. 54 p. pl. Lincoln, Nebr., 1913. (Nebraska ornithologists' union. Proceedings, v. 5, pt. 5.)

Periodical Articles

Miscellaneous periodicals

American city, Feb. 1913.—Protection of shade trees, by H. J. Neale, p. 153-6; Treatment of ornamental or cultivated chestnut trees, by R. G. Pierce, p. 157-9.

American city, March 1913.—Electric wires and shade trees, by A. Gaskill, p. 270-2; Shade tree planting that might have been done better, p. 272-4.

American sheep breeder, April 1913.—Grazing in national forests, by Albert F. Potter, p. 214-15.

Botanical gazette, March 1913.—Poisoning by ginkgo, by Anna M. Starr, p. 251.

Bulletin of the Pan-American union, April 1913.—The timber lands of Panama, by C. H. Forbes Lindsay, p. 499-510.

Country gentleman, Feb. 22, 1913.—Chestnut blight; making the most of a bad situation, by Nelson C. Brown, p. 289-90.

Country gentleman, April 19, 1913.—Stumping pine lands, by B. L. Moss, p. 644-5.

Gardeners' chronicle, April 26, 1913.—Destructive insects and pests; 8: The gipsy moth, by H. C. Long, p. 263-4.

Independent, March 20, 1913.—Problems of national forestry, by H. S. Graves, p. 639-43.

Journal of botany, April 1913.—The british willows, by E. F. Linton, p. 1-8.

La Follette's weekly, April 19, 1913.—Control of waterways; disastrous floods may be prevented and the annual run-off utilized in the nation's interest, by Francis G. Newlands, p. 4, 14-15.

Leslie's weekly, April 17, 1913.—How we may guard against floods, by Franklin K. Lane and others, p. 414.

Muhlenbergia, March 1913.—The oaks of the Pacific slope; 1: Quercus lobata, by A. A. Heller, p. 39-44.

Outlook, April 26, 1913.—The tree planters, by Chas. M. Dow, p. 902-8.

Pearson's magazine, May 1913.—"Conservation as practiced," by Gifford Pinchot, p. 619-27.

Scientific American, May 3, 1913.—Floods and the problems of river regulation, by Charles Whiting Baker, p. 398-401; A silicious wood preservative, p. 401; A black walnut burl, p. 408.

Trade journals and consular reports

American lumberman, April 12, 1913.—Estimating the height of trees, p. 35; Naval stores important in south's industrial history, p. 45.

American lumberman, April 19, 1913.—Charts illustrating quarter-sawing, p. 33, 55; Briqueting sawdust, p. 48; Which loader is best? p. 50-50A.

American lumberman, May 3, 1913.—Log loader designed by practical lumberman, p. 46-7.

American lumberman, May 10, 1913.—Steam log skidders, p. 54-5.

Canada lumberman, April 15, 1913.—The camper causes many forest fires, p. 29; Lumber transportation by sluice-way, p. 30-1; Wholesale lumber prices in 1912 in Canada, p. 39; Modern door manufacturing methods; the Paine company's plant, Oshkosh, Wis., p. 42-3.

Canada lumberman, May 1, 1913.—Red pine percentage volume increase, by A. H. D. Ross, p. 32-3; The wood-using industries of Ontario, p. 34-7; Preserving timber with zinc chloride, p. 44-5.

Carriage monthly, April 1913.—Wilful lumber waste in the United States, by J. H. von Groten, p. 67.

Engineering news, Jan. 30, 1913.—Extinguishing fires with sawdust, by Edwin A. Barrier, p. 217-18.

Hardwood record, April 25, 1913.—Profits from the sugar bush, p. 22-4; hardwood reforestation possibilities, p. 24-6; The walnuts and hickories, p. 27-9; Utilization of hardwood waste, by R. B. Goodman, p. 32-3; What is poon? p. 35.

Hardwood record, May 10, 1913.—Gravity lumber conveyors, p. 21; Leaf seasoning timber, p. 22; Checking of wood in seasoning, by S. J. Record, p. 25-7; A new wood preserver, p. 27; Commercial hardwoods from tropical America, p. 30-2; Soda dipping for sap-stain, p. 33.

Lumber trade journal, April 15, 1913.—"Sugi" cypress a coming wood for mission furniture manufacture, p. 17; Utilization of the wood waste in the forests of east Texas, by C. T. Dowell, p. 24-5.

Lumber world review, April 10, 1913.—Forest surveys in timber land operations, by E. A. Sterling, p. 25-6.

Lumber world review, April 25, 1913.—Utilizing yellow pine mill waste, by C. T. Dowell, p. 36-7.

Mississippi Valley Lumberman, April 11, 1913.—The Crown silo is exclusively for the retail yard trade, p. 42-3.

Paper trade journal, April 3, 1913.—No fear of spruce bud moth; small unnamed spider has practically exterminated the moths, p. 10.

Pulp and paper magazine, April 1, 1913.—Sluice operation in connection with wood-handling equipment, p. 218-21; The silkworm has a rival in wood, p. 225; Commercial wood pulp processes; the utilization of spent extractive liquors, by Thomas J. Keenan, p. 239-42.

Railway and engineering review, May 10, 1913.—Hardwood tie plates on European railways, by M. Matthei, p. 435; Protection of ties from rail wear, p. 439.

St. Louis lumberman, April 15, 1913.—Progress of forestry in New York, by Hugh P. Baker, p. 26-7; Development of creosoted wood block pavement in United States, by H. L. Collier, p. 70B-D.

Southern industrial and lumber review, April 1913.—Solution of the cut-over land problem, by H. S. Sackett, p. 64-6; Development of silos in the southwest, p. 75.

Timber trades journal, April 12, 1913.—What makes heart breaks? by John H. Talge, p. 795.

Timberman, April 1913.—Relative durability of western woods practically demonstrated, by B. L. Groendal, p. 28-30; Timber supply northern and southern states, by H. F. Chaney, p. 45-7; Importance of power and equipment for hillside logging operations, by C. O. Cole, p. 52-3.

United States daily consular report, April 22, 1913.—Australian timber resources and industry, p. 396-7.

United States daily consular report, April 23, 1913.—Making skis in Norway, by Charles A. Holder, p. 420; West African mahogany on British market, by W. J. Yerby, p. 428; The maple sugar season in Canada, by Chas. N. Daniels, p. 443.

Wood craft, May 1913.—Music cabinets, their design and construction, by John Bovingdon, p. 36-9; The manufacture of wood pipe, by E. F. Week, p. 45-6; Preservatives for wood in mines, by E. Kilburn Scott, p. 58-9.

Forest journals

Boletin de bosques, pesca i caza, Feb. 1913.—El pino Colorado, o Sequoia sempervirens, by Federico Albert, p. 508-17; La acacia blanca, by Federico Albert, p. 518-23; Informe sobre la reserva forestal de Villarrica, by A. Velosa, p. 523-30; Description de la reserva forestal de Concepcion, by Daniel Zelada, p. 530-6.

Canadian forestry journal, April 1913.—Regulating cutting in British Columbia, by A. V. Gilbert, p. 55-6; Record and care of plantations in foreign countries, by George H. Retan, p. 56-7; The work of a forest engineer, by A. H. D. Ross, p. 58-61.

Centralblatt für das gesamte forstwesen, Feb. 1913.—Neues über den hausschwamm, by Karl Havelik, p. 60-5.

Centralblatt für das gesamte forstwesen, March 1913.—Bisherige erfahrungen über die zur Karstaufforstung in Krain verwendeten holzarten, by K. Rubbia, p. 99-108.

Indian forester, April 1913.—The supply of railway sleepers in India, by R. S. Pearson, p. 169-73; The bamboo forests of the Pegu forest division and the method of extraction, by A. J. Butterwick, p. 176-83; Forestry in Trinidad, by C. S. Rogers, p. 183-93; Note on tapping of Boswellia serrata trees in the Siwalik division, U. P., by R. S. Pearson, p. 196-201; Note on fuel floating in the Himalayas, by E. A. Smythies, p. 202-3.

North woods, April 1913.—Forestry as a profit yielding industry, by A. F. Woods, p. 3-6; The value of a wood lot, by P. C. Records, p. 7-14; Forestry club of the state university, by Robert Howarth, p. 15-17.

Revue des eaux et forêts, March 15, 1913.—A propos de la loi "Sur la conservation des forêts privées," by Ch. Guyot, p. 161-171.

Revue des eaux et forêts, April 1, 1913.—Notes sur l'aménagement des futaies jardinées, by Pierre Joseph Bizot de Fonteny, p. 193-204; Variétés et types divers du pin sylvestre, by Cannon, p. 204-6; Graines forestières; influence de leur provenance sur la qualité des plants, by L. Pardé, p. 207-8; Action comparé du sulfate de manganèse et du sulfate de calcium sur les germinations de pin maritimes, by Lucien Chancerel, p. 208-9.

Schweizerische zeitschrift für forst- und jagdwesen, March 1913.—Tagesfragen zur etatermittlung und wirtschaftskontrolle, by Philipp Flury, p. 65-74; Der schweizerische nationalpark im unterengadin, by Decoppet, p. 76-86; Eine neue messkluppe, p. 89-91.

FORESTRY QUARTERLY

¶ Colleges, Foresters, Lumbermen, Timberland Owners and Students of forestry need this technical quarterly journal in order to keep in touch with current technical literature and the forestry movement in the United States, Canada and foreign countries. ¶ It is edited by B. E. FERNOW, LL. D., of the University of Toronto, and an able staff of leading foresters.

ORDER NOW

American Forestry Association, Washington, D. C.

Enclosed find $2.00 for **Forestry Quarterly** for one year.

Name.....

Address.....

FOR SALE

100,000 Acres of Land covered with Spruce Pulp Wood. This tract consists of 1,000,000 cords of Pulp Wood, 80% of which is Spruce, the balance Fir.

The location is on Rivers and Lakes flowing into the Sea on tide water, Atlantic Coast, navigable throughout the year.

Cost of wood, in mill, $3.00. Cost of Pulp, f. o. b. vessel, $7.50. Freight to New York, $1.00 per ton (dead weight).

Abundance of labor. No export duty or stumpage, no property tax. Average haul for logs one mile to River.
For further information, address

TIMBER LIMITS, care of
AMERICAN FORESTRY ASSOCIATION
WASHINGTON, D. C.